"Floristic and Ethnobotanical Documentation of Medicinal Plants from Ankai–Tankai Fort, Maharashtra, India"

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Abstract

The present study focuses on the survey and collection of medicinal plants from the Ankai–Tankai Fort region, situated in the Nashik district of Maharashtra. The fort area is characterized by rich biodiversity and varied topography, including rocky slopes, grasslands, and forest patches that support numerous medicinally important plant species. Systematic field surveys were conducted during Mansoon seasons to document the diversity of medicinal plants. Each species was collected, identified, and classified based on standard floras and taxonomic references. The collected specimens were further preserved in the form of herbarium sheets for future reference. The study revealed a wide range of medicinal plants used in traditional and Ayurvedic practices, highlighting the ethnobotanical importance of the region. It also emphasizes the need for conservation of natural habitats to protect rare and valuable plant resources from overexploitation and habitat degradation. This work provides baseline data for further pharmacognostic, phytochemical, and conservation studies, contributing to the sustainable utilization of medicinal plant diversity in the Ankai–Tankai region.

Keywords: *Medicinal plants; Ethnobotany; Ankai–Tankai Fort; Biodiversity; Herbarium; Traditional medicine; Conservation; Nashik district; Maharashtra.*

Introduction

Medicinal plants are among nature's most valuable biological resources, forming the backbone of traditional healthcare systems and serving as important raw materials for modern pharmaceutical industries. Since ancient times, plants have been used for the prevention and treatment of diseases, and even today they remain a primary source of healthcare for a large section of the world's population. According to the World Health Organization (WHO), nearly 80% of the global population depends on plant-based medicines for primary healthcare needs. India, being one of the world's richest countries in terms of plant diversity, has a long history of medicinal plant usage documented in classical texts and floristic literature (Hooker, 1872–1897; Kirtikar & Basu, 1935; Chopra et al., 1956).

The state of Maharashtra is floristically rich and ecologically diverse, supporting a wide range of medicinally important plant species. The flora of the region has been extensively documented in standard floras such as *The Flora of the Presidency of Bombay* by Cooke (1903–1908) and *Flora of Maharashtra* by Almeida (1996–2003), which provide valuable taxonomic information on regional plant diversity. These works serve as important references for the identification and classification of medicinal plants.

The Ankai–Tankai Fort, located in the Nashik district of Maharashtra, is a region of remarkable ecological, botanical, and historical significance. The fort area is characterized by rocky hill slopes, plateaus, grasslands, and patches of semi-arid vegetation, creating diverse microhabitats that support a variety of plant species. Many of these plants possess medicinal properties and are traditionally used by local communities to treat ailments such as fever, skin diseases, digestive disorders, and respiratory problems. Similar floristic and medicinal plant studies in peninsular India highlight the importance of such regions as reservoirs of traditional knowledge and biodiversity (Gamble & Fischer, 1915–1935; Singh & Gupta, 2007).

Despite its biological richness and cultural importance, the medicinal plant diversity of the Ankai–Tankai Fort region has not been thoroughly and systematically documented. Proper documentation is essential not only for preserving traditional ethnomedicinal knowledge but also for conservation planning and sustainable utilization of plant resources. Standard field survey and herbarium techniques, as described by Jain and Rao (1977), play a crucial role in accurate plant identification and long-term preservation of botanical specimens.

Field surveys were conducted during the monsoon seasons to ensure comprehensive coverage of the vegetation, as this period supports maximum plant growth and flowering. Each collected specimen was properly processed, preserved, and identified with the help of standard floras and taxonomic keys, including works by Hooker (1872–1897), Cooke (1903–1908), Gamble and Fischer (1915–1935), and Almeida (1996–2003). The data generated through this study provide a valuable baseline for future pharmacognostic, ecological, and conservation-oriented research.

This project emphasizes the urgent need for the conservation of local medicinal flora, as many plant species are increasingly threatened due to habitat destruction, overharvesting, and unplanned land-use practices. The findings of the present study are expected to contribute to sustainable medicinal plant conservation strategies, promote awareness among local communities, and support future research in ethnobotany, biodiversity management, and natural resource conservation (Singh & Gupta, 2007).

Methodology

1.Selection of Study Area: The present study was conducted at Ankai–Tankai Fort, located in Yeola Tehsil of Nashik District, Maharashtra (India). The area was selected due to its rich biodiversity, ecological variation, and abundance of medicinal plant species. The fort region lies on the Deccan basaltic plateau, characterized by rocky terrain, variable soil types, and distinct microclimatic conditions, which support a wide range of vegetation. The accessibility of the site and its ecological uniqueness made it an ideal location for conducting a floristic and ethnobotanical survey.

2.Field Survey: Regular field surveys were carried out in and around the Ankai–Tankai Fort region to record and collect medicinal plant species. The surveys were performed during mansoon . Each plant specimen was carefully observed in its natural habitat, and relevant field notes were recorded, including habitat type, abundance, flowering and fruiting stages, and local names provided by residents and traditional healers. During each visit, the survey team will:

- Collection of the plant specimens.
- Record plant species.
- Take Geotag images of species.

3.Identification & Classification: The identification of plant species will be carried out using standard taxonomic keys and verified with regional flora references, including herbarium collections, and online databases. The team will use the following approach for identification and classification:

- Morphological Characteristics: Plants will be identified based on their morphological features such as leaf shape, size, flower structure, fruit type, and overall growth habit.
- Consultation with Experts: For any species that cannot be identified on-site, local botanical experts and regional floras will be consulted.

4. Documentation: All plant species surveyed will be thoroughly documented to provide a detailed record of the region's floristic diversity. The documentation will include:

- Geotagged Photographs: High-resolution photographs of each plant species will be taken, along with their geolocation data, using GPS enabled devices. This will ensure that each species is accurately located within the region and will help in future surveys to track species distribution.
- Data Management: All survey data, including photographs, species lists, and field notes, will be systematically organized and stored in a digital format. This will allow for easy access and sharing of data for further analysis and research.

***5. Herbarium Preparation*:** Representative plant specimens were mounted on herbarium sheets using standard mounting procedures. Each sheet included a label with details such as botanical name, family, locality, date of collection, habitat, and collector’s name. The prepared herbarium was preserved for future reference and academic use.

Table: Medicinal Plants from Ankai–Tankai Fort Region

Sr.No	Scientific Name	Local Name	Habit	Medicinal/ Traditional use
1	*Cissus quadrangularis L.*	Hadjod	Climber	Bone fracture healing, anti-inflammatory
2	*Clitoria ternatea L.*	Gokarna / Aparajita	Climber	Memory enhancer, anxiety, eye disorders
3	*Ipomoea triloba L.*	Lal Gokul Vel	Climber	Laxative, wound healing (folk use)
4	*Merremia vitifolia (Burm.f.) Hallier f.*	Undirkan Vel	Climber	Anti-inflammatory, skin ailments
5	*Cocculus hirsutus(L.) W.Theob.*	Vevati	Climber	Fever, skin diseases, cooling agent
6	*Achyranthes aspera L.*	Aghada	Herb	Cough, wound healing, diuretic
7	*Ageratum conyzoides L.*	Goat Weed	Herb	Wound healing, anti-inflammatory
8	*Aloe barbadensis Mill.*	Korphad	Herb	Burns, skin diseases, digestion
9	*Alysicarpus pubescens (Benth.) DC.*	-	Herb	Fodder, anti-inflammatory (folk use)
10	*Amaranthus viridis L.*	Tandulja	Herb	Digestive disorders, anemia
11	*Boerhavia diffusa L.*	Punarnava	Herb	Diuretic, kidney disorders
12	*Caesulia axillaris Roxb.*	-	Herb	Fever, inflammation (traditional use)
13	*Cyperus rotundus L.*	Nagarmotha	Herb	Digestive disorders, fever
14	*Echinops echinatus Roxb.*	Utkat	Herb	Anti-inflammatory, analgesic
15	*Impatiens balsamina L.*	Terda	Herb	Skin diseases, burns
16	*Kickxia incana (L.) Rothm*	-	Herb	Anti-inflammatory (folk use)
17	*Lavandula bipinnata (Roth) Kuntze*	Indian Lavender	Herb	Antiseptic, aromatic
18	*Mirabilis jalapa L.*	Gulabbas	Herb	Wound healing, skin ailments
19	*Ocimum sanctum L.*	Tulsi	Herb	Cold, cough, immunity booster
20	*Plectranthus barbatus Andrews*	Patharchur	Herb	Digestive disorders
21	*Pupalia lappacea (L.) Juss.*	Dantti	Herb	Wound healing
22	*Tridax procumbens L.*	Ghamra	Herb	Wound healing, hair growth
23	*Zinnia peruviana (L.) L.*	Zinnia	Herb	Anti-inflammatory (ornamental medicinal use)
24	*Calotropis gigantea (L.) Dryand.*	Rui	Shrub	Skin diseases, pain relief
25	*Datura fastuosa L.*	Dhotra	Shrub	Asthma, pain (toxic—controlled use)
26	*Datura innoxia Mill.*	Dhotra	Shrub	Sedative, analgesic
27	*Datura metel L.*	Dhotra	Shrub	Bronchial asthma (toxic)
28	*Datura stramonium*	Dhotra	Shrub	*Datura stramonium* is traditionally used to treat asthma
29	*Justicia adhatoda L.*	Adulsa	Shrub	Cough, bronchitis
30	*Sida acuta Burm.f.*	Chikana	Shrub	Anti-inflammatory, fever
31	*Gymnosporia montana* (Roth) Benth	Vekhandi	Shrub	Digestive disorders
32	*Nicotiana tabacum* L.	Tambaku	Shrub	Insecticidal, wound dressing
33	*Withania somnifera* (L.)	Ashwagandha	Shrub	Tonic, stress relief
34	*Abutilon indicum* (L.) Sweet	Petari	Shrub	Diuretic, anti-inflammatory
35	*Lantana camara* L.	Ghaneri	Shrub	Antimicrobial, wound healing
36	*Senna tora* (L.)	Takla	Shrub	Skin diseases
37	*Asclepias curassavica* L.	Kakatundi	Shrub	Anthelmintic (toxic)
38	*Jatropha curcas* L.	Mogali Erand	Shrub	Skin diseases, biofuel
39	*Euphorbia*	Crown of Thorns	Shrub	Skin disorders, latex use
40	*Ocimum americanum* L.	Ran Tulsi	Shrub	Cold, cough
41	*Senna alexandrina* Mill.	Sonamukhi	Shrub	Laxative
42	*Annona reticulata* L.	Ramphal	Tree	Anthelmintic, tonic
43	*Annona squamosa* L.	Sitaphal	Tree	Antidiabetic, digestive
44	*Azadirachta indica* A. Juss.	Neem	Tree	Antiseptic, skin diseases
45	*Cocos nucifera* L.	Naral	Tree	Nutritive, cooling

46	*Ficus arnottiana* (Miq.) Miq.	Paras Pipli	Tree	Anti-inflammatory
47	*Ficus benghalensis* L.	Wad	Tree	Diabetes, wound healing
48	*Ficus racemosa* L.	Umbar	Tree	Digestive disorders
49	*Mangifera indica* L.	Amba	Tree	Diarrhea, antioxidant
50	*Murraya koenigii* (L.)	Kadipatta	Tree	Digestive, antidiabetic
51	*Tamarindus indica* L.	Chinch	Tree	Digestive, laxative
52	*Tecoma stans* (L.)	Pivla Sonchafa	Tree	Antidiabetic
53	*Wrightia tinctoria* (Roxb.)	Kala Kuda	Tree	Skin diseases
54	*Ziziphus mauritiana Lam.*	Bor	Tree	Digestive, tonic

Result

The survey and collection of medicinal plants from Ankai-Tankai Fort resulted in the identification and documentation of a total of 54 medicinal plant species. These species include herbs, shrubs, climbers, and trees distributed across diverse habitats such as rocky slopes, forested areas, grasslands, and fort surroundings. The documented species reflect the rich medicinal plant diversity of the region and highlight the ecological significance of the Ankai-Tankai Fort area as a valuable repository of traditional medicinal flora.

● ***Total Species Documented: 54***

- Climbers : 05
- Herbs : 18
- Shrubs : 18
- Trees : 13

Each species was geotagged, photographed, and described based on its morphological characteristics, habitat, and ecological significance. The identification and classification were carried out using authentic floras and standard botanical references. Several species were also observed in cultivated areas and home gardens, indicating a notable 70 anthropogenic influence on the local plant diversity of the Ankai Tankai region.

Discussion

The floristic survey conducted at Ankai-Tankai Fort revealed a remarkable diversity of 54 medicinal plant species, reflecting the rich biodiversity and ecological significance of this region. The study highlights the presence of a wide range of medicinally important plants belonging to different families and life forms such as herbs, shrubs, trees, and climbers. The diversity observed can be attributed to the region's unique topography, varied microclimatic conditions, and rocky terrain, which together create favorable habitats for a variety of plant species.

The survey also revealed the close association between traditional knowledge and local flora, as many of the recorded species are commonly used by local communities for treating ailments such as wounds, fever, cough, skin infections, and digestive problems. This underlines the importance of ethnobotanical heritage in preserving indigenous medicinal knowledge and promoting sustainable use of plant resources. Furthermore, several species were found growing in anthropogenically influenced areas, such as agricultural fields, home gardens, and near human settlements. This suggests a gradual shift in the natural distribution of certain plants due to human activity, cultivation practices, and habitat modification. Despite this, the persistence of a rich medicinal flora indicates the resilience and adaptability of these species in diverse environmental conditions. The documentation and identification process, which included geotagging, photography, and morphological analysis, not only ensured scientific accuracy but also created a valuable reference for future research and conservation efforts.

The data gathered from this study can serve as a baseline for biodiversity assessment, conservation planning, and pharmacognostic research in the region. Overall, the findings emphasize the need for conservation of medicinal plant resources at Ankai-Tankai Fort, as increasing human pressure and environmental degradation may threaten their natural populations. Promoting awareness, sustainable harvesting, and cultivation of these plants can help preserve both the biological and cultural heritage associated with the area's medicinal flora.

Conclusion

The present study on the Survey and Collection of Medicinal Plants from Ankai–Tankai Fort resulted in the documentation of a total of 54 medicinal plant species, representing the rich floristic diversity of the region. Among these, 18 species were herbs, 18 were shrubs, 13 were trees, and 5 were climbers. The findings highlight the ecological significance of the Ankai–Tankai Fort area as a valuable reservoir of medicinal flora, supporting both biodiversity and traditional healthcare practices. This study emphasizes the importance of systematic documentation, conservation, and sustainable utilization of medicinal plants to prevent the loss of valuable natural resources due to human interference and environmental changes. The recorded data can serve as a baseline for

future ethnobotanical, pharmacognostic, and conservation studies, thereby contributing to the preservation and scientific understanding of the medicinal plant wealth of this ecologically important region.

References

1. Almeida, M.R. (1996–2003). Flora of Maharashtra. Vols. I–IV. St. Xavier's College, Mumbai.
2. Chopra, R.N., Nayar, S.L. & Chopra, I.C. (1956). Glossary of Indian Medicinal Plants. Council of Scientific and Industrial Research (CSIR), New Delhi.
3. Cooke, T. (1903–1908). The Flora of the Presidency of Bombay. Taylor and Francis, London.
4. Gamble, J.S. & Fischer, C.E.C. (1915–1935). Flora of the Presidency of Madras. Adlard & Son Ltd., London.
5. Hooker, J.D. (1872–1897). The Flora of British India. L. Reeve & Co., London.
6. Jain, S.K. & Rao, R.R. (1977). A Handbook of Field and Herbarium Methods. Today & Tomorrow's Printers and Publishers, New Delhi.
7. Kirtikar, K.R. & Basu, B.D. (1935). Indian Medicinal Plants. 2nd Edition, Lalit Mohan Basu Publications, Allahabad.
8. Singh, J.S. & Gupta, S.R. (2007). Ecology, Environment and Resource Conservation. Anamaya Publishers, New Delhi.
9. Singh, N.P., Lakshminarasimhan, P., Karthikeyan, S. & Prasanna, P.V. (2001). Flora of Maharashtra State, Dicotyledons – Vol. 2. Botanical Survey of India, Kolkata.
10. Warrier, P.K., Nambiar, V.P.K. & Ramankutty, C. (1994). Indian Medicinal Plants: A Compendium of 500 Species. Vols. I–V. Orient Longman Ltd., Chennai.
11. Yadav, S.R. & Sardesai, M.M. (2002). Flora of Kolhapur District. Shivaji University, Kolhapur.