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Biodiversity of rare and threatened medicinal plants of Piprahi forest, Mauganj District (M.P.)

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Abstract

The current analysis delves into the diverse array of plant species observed through meticulous floristic data. Within the study area, a number of plants that are either rare or facing endangerment were documented. This paper meticulously records 31 plant species that fall under the categories of rare or endangered, providing their botanical names, local appellations, red data classifications, and their current status within the study area. The urgent need for conservation efforts becomes evident as many of these plant species demand immediate attention. The precarious state of these endangered species serves as a stark reminder that increased focus and dedication are imperative for their preservation. The present study also highlights that some rare or endangered plants abundantly found in Piprahi forest of Mauganj district. The protected forest area is observed as the best conservation model of the plant diversity and it harbors a large number of endangered and rare plants.

Keywords: Rare, threatened, Plants, Piprahi forest, Mauganj

Introduction

The intricate tapestry of biodiversity intricately weaves into the very fabric of our existence, touching both our daily lives and our very means of survival. It falls upon every nation to embrace their duty in safeguarding, rejuvenating, and responsibly harnessing the wealth of biological diversity that falls under their purview (Ahmad *et al.* 2006 and Gwalwanshi *et al.* 2014) ^[1-2]. The significance of biodiversity is a concept that eludes easy definition and often defies precise estimation (Mukherjee, 2010) ^[3]. In rural India, a significant portion of daily sustenance for tribal communities is sourced from the bounty of wild plants. Some examples are: *Ceropegia bulbosa* in Central India and Western Ghats; *Codonopsis ovata* in Himalayan region; *Ardisia* sp. and *Meliosma pinnata* in the North-East; *Eremurus himalaicus*, *Origanum vulgare* and *Urtica hyperborea* in Lahaul-Spiti and Ladakh; *Allium carolinianum* and *Cicer microphyllum* in Kashmir and *Sesuvium portulacastrum* in Coastal areas.

Throughout the earliest known human history, the use of herbal remedies for diseases has been a common practice. Primitive communities, with their close relationship to nature, have developed extensive knowledge of the healing properties of medicinal plants. They have complete faith in these time-honored medicines (Dushing and Patil, 2010) ^[4]. Out of the total 4,22,000 flowering plants reported from the world (Govaert, 2001) ^[5] more than 50,000 are used for medicinal purposes (Schippmann *et al.* 2002) ^[6].

In the traditional systems of India, nearly all prescriptions rely on plant-based remedies. Medicinal plants are crucial for human health and hold significant pharmaceutical value, contributing to a thriving industry with a trade value exceeding Rs. 3,500 crores. With the rising appreciation for natural products, their non-toxic nature, and widespread availability, the demand for these plants is on the rise, leading to an expansion in cultivation efforts (Nayak *et al.* 2000) ^[7]. For generations, inhabitants of tribal regions and rural communities have relied on traditional plant remedies passed down through the ages, rooted in ancestral wisdom and practical application (Pathak and Mishra, 2011) ^[8]. In remote realms distant from bustling cities, the tribes and villages reside, where the absence of healthcare facilities perpetually persists. The populace, predominantly comprising the underprivileged or the modestly affluent, find themselves burdened by the incessant escalation in the cost of artificial remedies. Consequently, the unavailability of exorbitantly priced synthetic drugs becomes an insurmountable obstacle (Shinwari and Khan, 1998) ^[9].

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Piprahi forest is located at 24.68°N 81.88°E. It has an average elevation of 313 metres (1,026 feet). Piprahi is a Hanumana Tehsil in Mauganj District of Madhya Pradesh State, India. It belongs to Rewa Division. It is located 123 KM towards East from District headquarters Rewa. 36 KM from Hanumana. 613 KM from State capital Bhopal. Dominant plants of the forest are sal, anwala, char, mahua, harra, aam, neelgiri, bidi patta, bahera, bija, khamhar, haldu, ghankat and saja. The halbas are the main tribe of this region. They utilize many species of forest flora for food, fiber, fodder, medicine, gums resins etc.

In consideration of the significance of the flora in the Piprahi forest of Mauganj district, this study aims to gather the indigenous wisdom of the local population regarding the medicinal properties of native plants. The inhabitants of these selected areas acquire this knowledge through firsthand observation of nature and through intergenerational communication within their culture. Therefore, the ethno-medicinal knowledge of these plants is deeply intertwined with the local history and customs. As the residents of this region predominantly rely on traditional methods of healing, this invaluable wealth of indigenous knowledge is passed down solely through oral means of transmission from one generation to the next (Sharma, 1990) [10]. This research endeavor aimed to meticulously document and safeguard the invaluable folk asset at hand

The primary objectives of this current research endeavor were to investigate the medicinal plants and their significance within the community of the selected Piprahi forest in Mauganj district. Additionally, the study aimed to document the traditional use of indigenous medicinal plants for common ailments, raise awareness among the local population about the importance of preserving native medicinal flora, and gather specimens of native medicinal plants for accurate identification and future research purposes.

Materials and Methods

Present study was confined to the identification of ethno medicinal plants used by traditional healers of selected

Piprahi forest of Mauganj district. The study was conducted during January, 2023 to December, 2023 in remote area of forest.

Regular excursions were scheduled to gather data on the condition of medicinal flora.

During our excursions, we utilized the Medicinal Plants Datasheet as a means to engage with the experienced locals, both men and women, who possessed knowledge of the local flora and its medicinal properties. In total, we interviewed 40 individuals, consisting of 30 men and 10 women, across various remote regions within the forest. To ensure accuracy, we diligently posed repeated inquiries to validate the information provided.

Regular excursions were organized to gather live specimens from the surrounding area. During these outings, a variety of plants were collected and then carefully dried and displayed on herbarium sheets. The specimens were then identified using reference materials and literature (Jain and Rao, 1976, Saxena *et al.* 1992, Mudgal *et al.* 1997, Verma *et al.*, 1993, Wagh & Jain, 2013 and Patel, 2023) [11-16] and comparing with the already identified plant specimens of the herbarium at Department of Botany, Govt. S.K. P.G. College, Mauganj (M.P.). After correct identification, the plants were deposited in herbarium at Department of Botany, Govt. S.K. P.G. College, Mauganj for future references. Ethno-medicinal inventory was developed consisting of botanical name followed by their local name, family, habit category in Red data book and present status during study.

Results and Discussion

Taxonomical surveys were conducted in different tracks in the forest areas of Piprahi forest of Mauganj district 186 angiosperm taxa were documented for floristic analysis. During the course of present investigations 186 plant species of which 140 were dicots and 46 monocots were collected and identified. The total number of enumeration of plants with species, genera and families are summarized in Table 1 & Fig. 1. The phyto-diversity ratio of species level between monocots to dicots is 1:3.0 of genera 1:4.5 and of families 1:8.0. The results are tabulated as below:

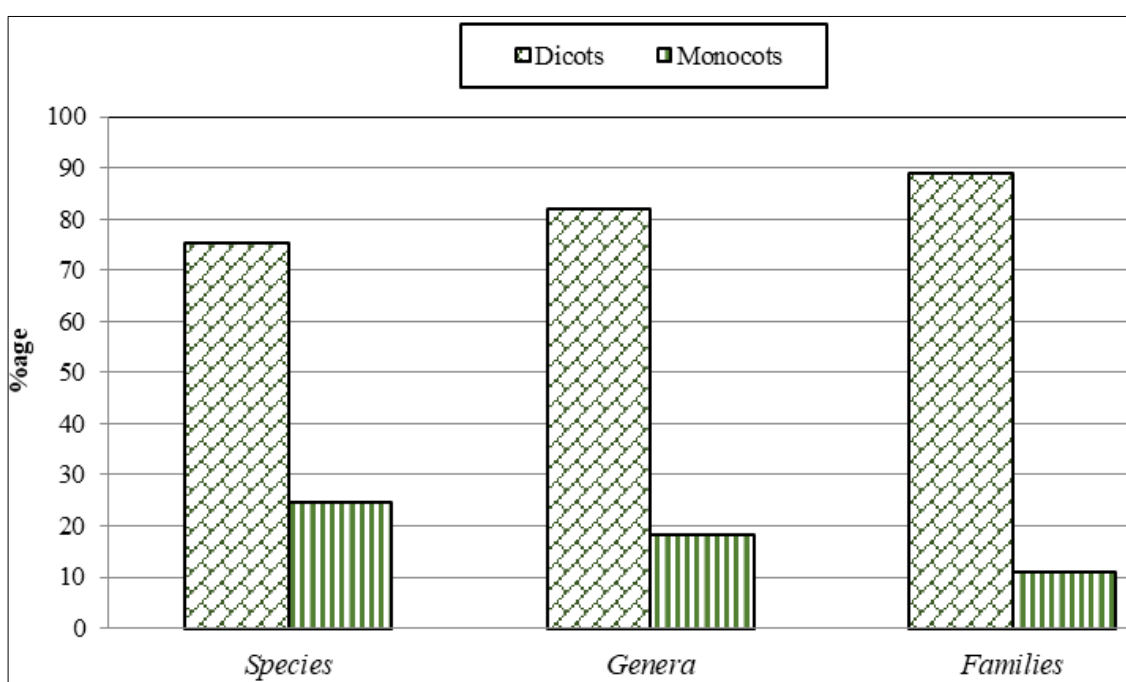


Fig 1: Graphics analysis at diversity of Dicot and Monocot

Table 1: Diversity of dicot and monocot

| S. No. | | Dicots | | Monocots | | Total | Ratio |
|--------|----------|--------|------------|----------|------------|-------|-------|
| | | Number | Percentage | Number | Percentage | | |
| 1. | Species | 140 | 75.27 | 46 | 24.73 | 186 | 1:3.0 |
| 2. | Genera | 90 | 81.82 | 20 | 18.18 | 110 | 1:4.5 |
| 3. | Families | 40 | 88.89 | 5 | 11.11 | 45 | 1:8.0 |

Table 2: List of rare and threatened plants of the piprahi forest

| S. No. | Family | Botanical name | Local name | Habit | Red data book category | Present status in study |
|--------|----------------|---|----------------|---------|------------------------|-------------------------|
| 1. | Alangiaceae | <i>Alangium salvifolium</i> L.F. Wang. | Ankol | Tree | Rare | EW |
| 2. | Apocynaceae | <i>Wrightia tinctoria</i> * R.Br. | Dhudhi | Tree | Invulnerable | LC |
| 3. | Asclepiadaceae | <i>Sarcostemma viminale</i> L.** | Sambher bel | Climber | Endangered | CR |
| 4. | Asteraceae | <i>Cythocline purpurea</i> Roxb. | Bhandaria | Herb | Vulnerable | VU |
| 5. | Burseraceae | <i>Boswellia serrata</i> Roxb.* | Salai | Tree | Rare | LC |
| 6. | Cesalpiniaceae | <i>Bauhinia vahalli</i> Wt Arn** | Kachnar bel | Climber | Rare | CR |
| 7. | Clastraceae | <i>Celastrus paniculata</i> Willd** | Malkagini | Climber | Rare | CR |
| 8. | Combretaceae | <i>Terminalia alata</i> * Heyne. Ex Roth. | Safeda | Tree | Invulnerable | LC |
| 9. | Combretaceae | <i>Terminalia bellirica</i> Gaertn. | Baheda | Tree | Invulnerable | EN |
| 10. | Convolvulaceae | <i>Argyrea nervosa</i> Dalz. | Naar | Climber | Invulnerable | EW |
| 11. | Dioscoreaceae | <i>Dioscorea bulbifera</i> L.** | Jatashan-kari | Climber | Endangered | CR |
| 12. | Ehretaceae | <i>Cordia dichotoma</i> Forst. | Lasora | Tree | Vulnerable | EN |
| 13. | Euphorbiaceae | <i>Mallotus Philippensis</i> Lam. | Sinduri | Tree | Rare | EN |
| 14. | Fabaceae | <i>Dalbergia latifolia</i> Roxb. | Safed shisham | Tree | Invulnerable | EN |
| 15. | Fabaceae | <i>Pterocarpus marsupium</i> Roxb** | Bija sal | Tree | Rare | CR |
| 16. | Gesneriaceae | <i>Didymocarpus pygmaea</i> Clarke. | Pathar phodi | Herb | Vulnerable | NT |
| 17. | Liliaceae | <i>Chlorophytum laxum</i> R. Br. | Safed mausali | Herb | Rare | EN |
| 18. | Liliaceae | <i>Gloriosa superba</i> Linn** | Kalihari | Climber | Endangered | EW |
| 19. | Malvaceae | <i>Abutilon bidentatum</i> Hoesh. | Kanghi | Herb | Invulnerable | VU |
| 20. | Mimosaceae | <i>Acacia catechu</i> * (L.f) Willd. | Khair | Tree | Invulnerable | LC |
| 21. | Mimosaceae | <i>Mimosa hamata</i> Willd. | Bander ki roti | Shrub | Invulnerable | NT |
| 22. | Nyctagenaceae | <i>Nyctanthes arbortristis</i> L.** | Harsingar | Tree | Vulnerable | CR |
| 23. | Rubiaceae | <i>Adina cordifolia</i> (Willd) ex Roxb. | Haldu | Tree | Vulnerable | NT |
| 24. | Rubiaceae | <i>Morinda tomentosa</i> Heyne. | Aal | Tree | Vulnerable | NT |
| 25. | Rutaceae | <i>Feronia limonia</i> L. | Kaitha | Tree | Invulnerable | EN |
| 26. | Salvadoraceae | <i>Salvadora persica</i> L. | Pilu | Tree | Invulnerable | EN |
| 27. | Sapotaceae | <i>Manilkara hexandra</i> Roxb.Dub ** | Khirani | Tree | Invulnerable | CR |
| 28. | Simaroubaceae | <i>Ailanthus excelsa</i> Roxb. | Aruu | Tree | Vulnerable | VU |
| 29. | Vitaceae | <i>Ampelocissus latifolia</i> Roxb** | Pannibel | Climber | Invulnerable | CR |
| 30. | Vitaceae | <i>Cissus rependa</i> Vahl. | Hadjod | Herb | Rare | EX |
| 31. | Zingiberaceae | <i>Curcuma pseudomontana</i> Grah. | Musali | Herb | Invulnerable | VU |

*Abundantly found in the study area, ** Extremely high risk of extinction in the wild condition EW - Extinct in wild, CR - Critically endangered - Extremely high risk of extinction in the wild, EN - Endangered - High risk of extinction in the wild, VU - Vulnerable - High risk of endangered in the wild, NT - Near threatened - Likely to become endangered in near future, LC - Least concern -Lowest risk to become near threatened.

In an effort to shine a light on the rare and endangered plant species in the area under study, it is imperative for government agencies and non-governmental organizations to step up and take on the responsibility of preserving this vital plant diversity. It is crucial to actively search for rare plants in every region of the country and implement protective measures to ensure their conservation, as they face imminent threats. Ultimately, both protected and unprotected forests play a crucial role in safeguarding our plant wealth, with Piprahi forest of Mauganj providing valuable habitats for in-situ conservation efforts.

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