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Study on Identification of Invasive Plants in Madhya Pradesh and Their Traditional Uses

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Abstract: Invasive (invasive) plants are foreign species that spread rapidly in new areas, causing damage to local biodiversity, ecology, and agriculture. In Madhya Pradesh, major invasive plants such as *Lantana camara, Parthenium hysterophorus, Prosopis juliflora , Ageratum conyzoides, Chromolaena odorata , and Argemone mexicana* are widely spread in forests, fields, roadsides, and rural areas. These plants suppress native species, reduce soil fertility, and disrupt biological balance.

This study identified six major invasive plants based on field surveys, interviews with local people and tribals, and photographic documentation. *Lantana camara* was found to be the most dominant, affecting large portions of the state's forest areas. Traditional uses recorded include Lantana leaves for wound healing, fever, and cough; Parthenium decoction for diarrhea, skin diseases, and urinary infections; Prosopis bark for asthma, etc.

The study reveals that while these plants pose an environmental threat, they are also useful in folk medicine, enabling preservation of local knowledge and sustainable utilization. Controlled management and utilization of these plants is essential for biodiversity conservation.

Keywords: Invasive plants, Invasive Alien Species, Madhya Pradesh, Ethnobotany, *Lantana camara, Parthenium hysterophorus*, Traditional Uses, Biodiversity, Folk Medicine.

Introduction - Madhya Pradesh is India's largest state, featuring dense forests, diverse climate, and rich biodiversity. Its flora holds global significance, but in recent decades, invasive alien plants have seriously threatened this balance. Invasive plants are non-native (alien) species that spread rapidly, suppress local plants, and alter ecosystems.

A total of 173 invasive plants have been recorded in India, many of which are major problems in Madhya Pradesh. Among them, Lantana camara is the most prominent, affecting over 40% of the state's forest areas (some studies report spread over more than 1.54 lakh sq km). Parthenium hysterophorus (Congress grass / Gajar ghas) is ubiquitous in fields and roadsides, while Prosopis juliflora (Vilayati babool) is rapidly expanding in arid regions. Others like Chromolaena odorata and Ageratum conyzoides are problematic in eastern and central districts.

These plants were mainly introduced for ornamental, fodder, or accidental reasons. Lantana was brought during the British era in the 1800s, while Parthenium arrived around the 1950s with imported grains. They inhibit germination of other seeds, absorb soil moisture, and reduce forage for wild animals. Affected areas in Madhya Pradesh include Vidisha, Raisen, Guna, Balaghat, Kanha Tiger Reserve, etc.

These plants cause not only environmental damage but also economic losses such as reduced crop yields, affected livestock, and increased health issues (allergies, skin diseases). However, a positive aspect is that many tribal and rural communities use them in traditional medicine.

Objectives of the Study: The objective of this study is to identify major invasive plants in Madhya Pradesh and document their traditional uses. This research is useful for preserving local knowledge and sustainable management.

Study Area and Methodology: Study Area: Primarily Vidisha district (23.52°N, 77.81°E), including Udaygiri Caves, forests around Sanchi, rural fields, and roadsides. General information was also collected at the state level from Guna, Raisen, Balaghat, etc. The area is tropical, with rainfall 1000-1200 mm and temperature 8-45°C.

Methodology: Entirely field survey-based. 10 field visits (each 3-4 hours). Plants observed along 1 km transects using transect method. Structured interviews with 30 local people (farmers, tribals, herbal sellers). Questions: "Where is this plant found?", "What is its use?", "For which disease?".

Plant identification based on leaves, flowers, fruits in the field and photographs. Photography using mobile. Data recorded in tables. Use information cross-verified.

Identification of Invasive Plants

Six major invasive plants identified in Madhya Pradesh:

1. ***Lantana camara* (Lantana)–** Shrubby, 1-3 m tall with multi-colored flowers. Dense growth observed in Vidisha forests and roadsides; affects over 40% of forest area in the state.
2. ***Parthenium hysterophorus* (Gajar Ghas) –** 1-2 m tall herbaceous plant with white flowers. Most commonly found in fields, markets, and roadside edges.
3. ***Prosopis juliflora* (Vilayati Babool)–** 5-10 m tall thorny tree found in arid areas.
4. ***Ageratum conyzoides* (Goatweed)–** Small herb with blue flowers, found in low-lying areas.
5. ***Chromolaena odorata* (Tivra Gandha) –** Shrubby with white flowers; rapid spread observed in eastern districts.
6. ***Argemone Mexicana* (Satyanashi) –** Yellow flowers, thorny herbaceous plant found along ruins, roadsides, and field edges.

In Vidisha, Lantana and Parthenium cover over 70% of the area.

Traditional Uses : Despite being harmful, these plants are useful in folk medicine:

1. ***Lantana camara*:** Leaf decoction used for fever, cough, and cold. Paste applied on wounds for humans and animals. Root powder useful for toothache; famous among tribals for wound healing.
2. ***Parthenium hysterophorus*:** Decoction used for diarrhea, dysentery, urinary infections, and skin diseases. Also used for rheumatic pain and diabetes.
3. ***Prosopis juliflora*:** Bark decoction for asthma and bronchitis; leaves for skin diseases.
4. ***Ageratum conyzoides*:** Leaves used for wound healing and reducing swelling.
5. ***Chromolaena odorata*:** Used for wound healing and as a pain reliever.
6. ***Argemone mexicana*:** Seed oil used for skin diseases (with caution).

22 out of 30 people confirmed the uses.

Results and Discussion: Results identified six major plants. *Lantana camara* was the most invasive (present at 80% sites), densely found in Vidisha forests and roadsides. *Parthenium hysterophorus* dominant in fields and markets, *Prosopis juliflora* in arid areas. The other three are less dominant but increasing.

In traditional uses, 70% respondents found Lantana effective for wounds and fever. Parthenium for skin diseases and diarrhea, Prosopis for asthma. Acceptance rate over 56%. Matches studies in western Madhya Pradesh (high use among 102 invasive plants).

Discussion: These plants are environmental threats (crop loss, allergies, soil degradation), but their use reduces pressure on native medicinal plants, potentially benefiting biodiversity. Toxicity (e.g., skin irritation from Parthenium) is a current challenge. Controlled use (pastes/decoctions) can be beneficial, but scientific validation is necessary. In Madhya Pradesh, this dual role demands sustainable management—reducing invasiveness while promoting utilization. Balance between ethnobotany and ecology is essential.

Conclusion: Invasive plants in Madhya Pradesh pose a major challenge to biodiversity, agriculture, and health, but their traditional uses offer positive opportunities. Surveys at Vidisha district and state level identified key plants (Lantana, Parthenium, Prosopis, etc.) and documented their uses in folk medicine (wounds, fever, skin diseases, asthma, etc.). This shows these plants are part of local knowledge and their use can reduce pressure on native species.

Negative impacts (allergies, crop loss, soil quality decline) must be controlled. Suggestions: Run rural awareness programs highlighting both benefits and harms; encourage harvesting but preserve useful parts; increase phytochemical studies to isolate active compounds.

This research contributes to local knowledge preservation and aligns with sustainable development goals (biodiversity, health, environment). Invasive plants should not be viewed only as problems but managed by understanding their dual aspects. This will strengthen both Madhya Pradesh's biodiversity and folk medicine. Larger-scale surveys and policy formulation are needed in the future.

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