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# INTEGRATING TRADITIONAL TRIBAL HERBAL KNOWLEDGE WITH MODERN PHARMACOLOGY: A CASE STUDY FROM CENTRAL INDIA

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**ABSTRACT**

Traditional tribal medicinal knowledge has been a cornerstone of primary healthcare for indigenous populations in Central India for centuries. Despite its immense therapeutic potential, much of this knowledge remains undocumented or scientifically unexplored. This study aims to bridge the gap between indigenous herbal practices and modern pharmacological evaluation. A total of 25 traditional healers (Baigas and Gonds) from the forest regions of Madhya Pradesh and Chhattisgarh were interviewed using ethnobotanical surveys. Twenty commonly used medicinal plants for treating infections, inflammation, wounds, and metabolic disorders were identified. Selected plants such as Andrographis paniculata (Kalmegh), Nyctanthes arbor-tristis (Harsingar), and Cassia fistula (Amaltas) were subjected to phytochemical screening and antimicrobial assays. Ethanolic extracts of Kalmegh showed 78% inhibition against Staphylococcus aureus, while Harsingar leaf extract demonstrated strong anti-inflammatory activity (40% COX-2 inhibition in vitro). The study confirms that traditional tribal formulations possess significant pharmacological effects comparable to standard drugs, highlighting the need for bioprospecting, documentation, and ethical benefit-sharing. This integration of ethnomedicine with laboratory validation may accelerate the development of novel plant-based therapeutics.

## INTRODUCTION

India is home to over 700 tribal communities, many of whom rely exclusively on natural resources for healthcare. In regions of Central India such as Mandla, Dindori, Bastar, and Balaghat, tribes like Baiga, Gond, and Kol possess extensive knowledge of medicinal plants. Yet, only a fraction of this knowledge has been scientifically analyzed.

Modern pharmacology increasingly recognizes the value of traditional wisdom. Many commercial drugs—such as aspirin (from willow bark) and quinine (from cinchona)—originated from ethnobotanical sources. However, tribal healers' knowledge is rapidly diminishing due to modernization and lack of documentation. This study seeks to systematically collect herbal formulations, validate their efficacy in laboratory analysis, and create a framework for ethical integration.

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## METHODOLOGY

### Data Collection (Ethnobotanical Survey)

- Region: Mandla &Balaghat districts (Madhya Pradesh) Bastar (Chhattisgarh).
- Participants: 25 tribal healers (age 40–75).
- Tools: Semi-structured interviews, field walks, plant specimen collection.

### Plant Selection & Authentication

20 species identified for wound healing, fever, skin disorders, digestive issues, and bone fractures.

### Phytochemical Screening & Bioassay

- Solvent: Ethanol & aqueous extracts.
- Tests conducted:
  - Antimicrobial (agar diffusion method)

- Anti-inflammatory (COX-2 inhibition assay)
- Antioxidant activity (DPPH assay)

**Data Analysis**

**Table 1: Frequently Used Tribal Medicinal Plants**

| Local Name | Botanical Name | Primary Use | Preparation |
|---|---|---|---|
| Kalmegh | Andrographis paniculata | Fever, Infection | Decoction |
| Harsingar | Nyctanthes arbor-tristis | Joint Pain, Malaria | Leaf Paste |
| Amaltas | Cassia fistula | Constipation, Detox | Fruit Pulp |
| Giloy | Tinospora cordifolia | Immunity, Fever | Stem Extract |
| Baheda | Terminalia bellirica | Cough, Throat Infection | Powder |

**Table 2: Pharmacological Validation of Selected Extracts**

| Plant Extract | Antimicrobial Inhibition (S. aureus) | COX-2 Inhibition | Antioxidant (%) |
|---|---|---|---|
| Kalmegh (EE) | 78% | 35% | 60% |
| Harsingar (Leaf EE) | 55% | 40% | 58% |
| Giloy (Stem AE) | 50% | 32% | 65% |

**Case Study (Field Documentation)**

A 62-year-old *Baiga* healer used a blend of *Giloy* stem paste and *Baheda* powder to treat chronic skin infection in a villager. The wound healed in 12 days without antibiotics. Laboratory analysis later confirmed antimicrobial activity of the same formulation.

**Questionnaire Outcomes Healer Perspectives (n=25):**

1. Do you believe tribal medicine can work alongside modern medicine? – Yes (92%)
2. Are you willing to document your knowledge for public use? – Yes (76%)
3. Concern about misuse without credit or benefit? – High (85%)

**Researcher Perspectives (n=10):**

1. Should tribal formulations be standardized? – Yes (100%)
2. Best approach? – Joint clinical validation with benefit sharing

**CONCLUSION**

Traditional tribal herbal knowledge presents a vast and untapped pharmacological resource. Many remedies used by Central Indian tribes show measurable antimicrobial and anti-inflammatory properties comparable to modern drugs. Systematic integration through phytochemical validation, ethical documentation, and commercial benefit-sharing could transform indigenous wisdom into globally accepted therapeutics.

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