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Abortifacient Phytotherapy in Indigenous Healthcare Practices: An Ethnobotanical Survey from Bhandara District, Maharashtra, India

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Abstract
Bhandara district, located in the eastern Vidarbha region of Maharashtra, India, is endowed with rich floristic and cultural diversity. The tribal communities of the district, especially those living close to forest areas, rely extensively on forest resources for their daily needs, including healthcare practices. This study aimed to document the ethnomedicinal plants used as abortifacients by tribal people in Bhandara district, highlighting traditional knowledge and plant usage patterns. Field surveys and semi-structured interviews were conducted with traditional healers, elder women, and knowledgeable community members to record plant species, local names, plant parts used, preparation methods, and administration practices. Voucher specimens were collected and identified using standard floras. The study recorded 19 angiosperm species used as abortifacients, of which 16 were dicotyledons and 3 monocotyledons, belonging to 13 families. Leaves were the most commonly used plant part (10 species), followed by seeds (3 species), bark and roots (2 species each), and fruits and whole plant (1 species each). The results highlight the dominance of dicotyledonous plants and the preference for leaves, reflecting sustainable harvesting practices and ethnopharmacological knowledge. The findings underscore the importance of indigenous knowledge in reproductive healthcare and provide a basis for future pharmacological investigations. Conservation and sustainable use of these medicinal plants are essential to preserve traditional practices and biodiversity.

Keywords: Abortifacient, Ethnobotany, Traditional medicine, Tribal knowledge, Bhandara, Maharashtra

Introduction

Ethnomedicinal knowledge represents an important component of the traditional healthcare system, particularly among tribal communities residing in forested regions of India. Indigenous people rely on plant resources for the treatment of various ailments, including reproductive and gynecological disorders [1,2]. Bhandara district, in the eastern Vidarbha region of Maharashtra, is rich in floristic and cultural diversity. Tribal populations such as the Gond, Rajgond, Halba, Halbi, Holi, and Pardhi communities have historically depended on forests for their subsistence and healthcare needs. The traditional knowledge of these communities offers valuable insights into plant use for abortifacient purposes, reflecting centuries of empirical observation and experimentation.

Previous ethnobotanical studies in Maharashtra and central India have documented the use of plants for gynecological purposes, emphasizing the prevalence of dicotyledons and the use of specific plant parts such as leaves, roots, and seeds [3, 4,5]. However, most of these studies were geographically limited and often focused on single plant species or communities. There remains a research gap in systematically documenting abortifacient plants across tribal communities in Bhandara district, including information on plant parts, preparation methods, and administration practices.

The present study aims to address this gap by providing a comprehensive survey of abortifacient plants used by tribal communities in Bhandara district. The objectives include

i) Documenting the diversity and taxonomic distribution of plants used as abortifacients,
ii) Recording the plant parts utilized and traditional preparation methods,
iii) Assessing the relative importance of different species within the community, and
iv) Highlighting potential candidates for pharmacological validation.

The study also emphasizes the importance of conservation of medicinal plants and sustainable use practices. Limitations of the study include seasonal availability of plants, the sensitivity of reproductive health topics, and the lack of quantitative dosage information for many remedies.

Material and Methods

Study Area

The study was conducted in Bhandara district, eastern Vidarbha region of Maharashtra, India. The district is characterized by dry deciduous forests and mixed forest patches, which support a rich diversity of angiosperm species. Tribal communities such as Gond, Halba, Kanwar, and Pardhan rely heavily on forest resources for food, medicine, and daily necessities [6,2,7].

Field Surveys and Data Collection

Field surveys were conducted from 2015 to 2022. Villages and forest-adjacent settlements were selected based on the presence of tribal populations and accessibility to traditional healers, elder women, and other knowledgeable informants [1,8]. Semi-structured interviews were employed to document local knowledge on abortifacient plants, including vernacular names, plant parts, preparation methods, routes of administration, and dosage information. Direct observation and participant interaction were used to verify plant usage and preparation practices [9,10].

Plant Collection and Identification

Voucher specimens were collected following standard herbarium protocols [11]. Identification was carried out using authoritative floras: Flora of Nagpur District [12], Flora of Maharashtra State [13], Flora of Marathwada [14], and The Flora of the Presidency of Bombay [15]. Specimens were verified with the assistance of expert taxonomist and deposited in the Department of Botany Herbarium, Dharampeth M. P. Deo Memorial Science College, Nagpur for future reference.

Ethnobotanical Analysis

Plant species were categorized based on the part used (leaves, roots, bark, seeds, fruits, or whole plant) and preparation method (paste, decoction, juice, or powder). The frequency of citation (FC), relative frequency of citation (RFC) for each species was calculated to estimate its relative importance index (RI) in the community [16,17]. Analysis was performed to identify trends in the use of dicotyledons versus monocotyledons [4,5].

Ethical Consideration

Informed consent was obtained from all participants, emphasizing voluntary participation and confidentiality. The study adhered to ethical guidelines for ethnobotanical research and respected cultural sensitivities regarding reproductive healthcare [3,8].

Results and Discussion

The survey documented 19 angiosperm species used as abortifacients, including 16 dicotyledons and 3 monocotyledons, belonging to 13 families (Table 1). The predominance of dicotyledons is consistent with previous findings in central India and Maharashtra, where dicotyledonous plants dominate traditional reproductive healthcare practices [2,1,8].

Table 1: List of Abortifacient Plants

S. No.	Specimen No.	Botanical Name	Ver. Name	Family	Part Used
1	PTH0021	Abrus precatorius L.	Gunja	Fabaceae	Seeds
2	PTH0556	Ananas comosus (L.) Merr.	Ananas	Bromeliaceae	Leaves
3	PTH0038	Annona squamosa L.	Sitaphal	Annonaceae	Seeds
4	PTH0983	Asparagus racemosus Willd.	Marbat	Asparagaceae	Roots
5	PTH0498	Caesalpinia pulcherrima (L.) Sw.	Shanksur	Fabaceae	Bark
6	PTH0397	Cassia fistula L.	Bahawa	Fabaceae	Fruits
7	PTH0495	Celastrus paniculatus Willd.	Dhiwarvel	Celastraceae	Bark
8	PTH0869	Cicer arietium L.	Chana	Fabaceae	Leaves
9	PTH0317	Cleistanthus collinus (Roxb.) Benth. ex Hook. f.	Garadi	Phyllanthaceae	Leaves
10	PTH0601	Crotalaria juncea L.	Sontag	Fabaceae	Leaves
11	PTH0804	Cynodon dactylon (L.) Pers.	Harari	Poaceae	Whole plant
12	PTH0409	Dolichandrone falcata (Wall. ex DC.) Seem.	Irjan	Bignoniaceae	Leaves
13	PTH0530	Jatropha curcas L.	Chandar-jyoti	Euphorbiaceae	Seeds
14	PTH0805	Justicia adhatoda L.	Adulsa	Acanthaceae	Leaves
15	PTH0141	Plumbago zeylanica L.	Chitrak	Plumbaginaceae	Roots
16	PTH0050	Rhynchosia minima (L.) DC.	Kulta	Fabaceae	Leaves
17	PTH0055	Sida acuta Burm. f.	Chikna	Malvaceae	Leaves
18	PTH0818	Stachytarpheta jamaicensis (L.) Vahl	Kukrijad	Verbenaceae	Leaves
19	PTH0104	Uraria lagopodioides (L.) DC.	Pithvan	Fabaceae	Leaves

Prominent plant families included Fabaceae, Asteraceae, and Euphorbiaceae, reflecting both ecological abundance and recognized medicinal properties (Figure 1). Roots and bark, although less commonly used, are known to contain potent bioactive compounds contributing to abortifacient activity [3,18].

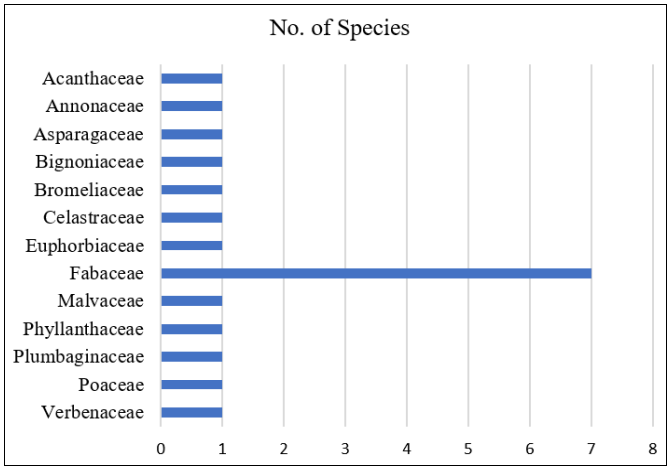

Fig 1: Families with number of plants used

Leaves were the most frequently used plant part (10 species), followed by seeds (3 species), bark and roots (2 species each), and fruits and whole plant (1 species each) (Figure 2). This pattern indicates a preference for easily accessible and renewable plant parts, consistent with sustainable harvesting practices [16,17,4].

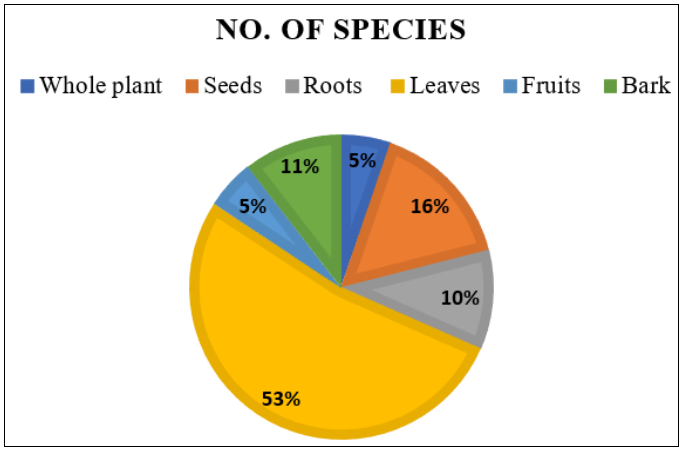

Fig 2: Number of plants with plant used

On the basis of plant habit, analysis of the 19 abortifacient species recorded from the study area revealed that herbs were the most dominant group, comprising 9 species. Trees formed the second largest category with 6 species, while shrubs and twiners were represented by 2 species each (Figure 3). The predominance of herbs and trees in abortifacient practices indicates their easy availability, accessibility, and sustained use in indigenous healthcare traditions. Herbs, being abundant and commonly distributed in the forest ecosystem, provide rapid access to plant parts such as leaves, roots, and seeds, whereas trees contribute durable and potent resources like bark and fruits. The relatively lower representation of shrubs and twiners suggests their limited occurrence or specialized ethnomedicinal roles. This distribution pattern highlights the adaptive strategies of tribal communities in selecting plant resources based on availability, efficacy, and cultural preferences in their traditional healthcare systems.

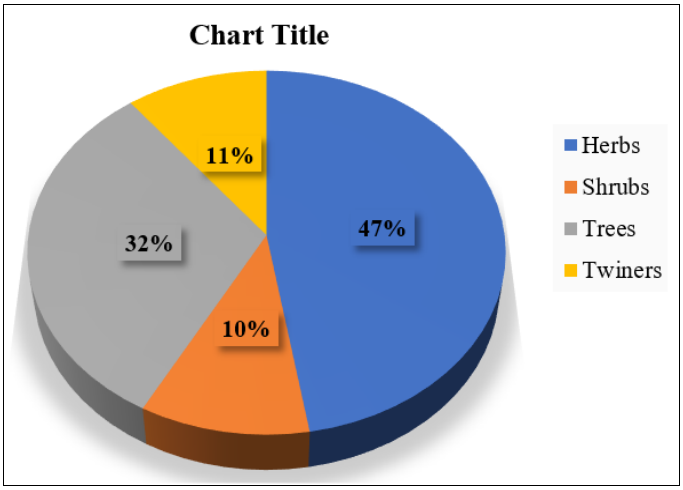

Fig 3: Habit of the plants used

The quantitative ethnobotanical assessment of 19 abortifacient plant species revealed variation in their frequency of citation (FC), relative frequency of citation (RFC), and relative importance (RI), reflecting differences in cultural significance and therapeutic preference within the study area.

The highest FC values were recorded for Celastrus paniculatus Willd. (95.83), Asparagus racemosus Willd. (91.67), and Cleistanthus collinus (Roxb.) Benth. ex Hook. f. (91.67), suggesting their dominant use and recognition among local healers. In contrast, Ananas comosus (L.) Merr. (20.83) and Cicer arietinum L. (33.33) showed the lowest FC, indicating limited reliance on these species for abortifacient purposes. RFC values followed a similar trend, with Celastrus paniculatus Willd. (0.96), Asparagus racemosus Willd. (0.92), and Cleistanthus collinus (Roxb.) Benth. ex Hook. f. (0.92) ranking highest, showing widespread cultural acceptance. Ananas comosus (L.) Merr. Exhibited the lowest RFC (0.21), reinforcing its marginal role in the community's ethnomedicinal practices. The RI analysis provided further insights into the comparative importance of species. Based on RI values, the plants can be grouped into three categories:

High Ethnobotanical Importance (RI > 5.0)

Plumbago zeylanica L. (5.99), Justicia adhatoda L. (5.38), Cleistanthus collinus (Roxb.) Benth. Ex Hook. f. (5.24), and Celastrus paniculatus Willd. (5.10). These species are consistently cited, widely used, and culturally important, making them prime candidates for phytopharmacological validation.

Medium Ethnobotanical Importance (RI 3.0–5.0)

Uraria lagopodioides (L.) DC. (4.95), Asparagus racemosus Willd. (4.39), Jatropha curcas L. (4.08), Rhynchosia minima (L.) DC. (3.82), Sida acuta Burm. f. (3.64), Cassia fistula L. (3.63), and Dolichandrone falcata (Wall. ex DC.) Seem. (3.41). These species hold significant recognition and may represent regionally important but moderately widespread practices.

Low Ethnobotanical Importance (RI < 3.0)

Abrus precatorius L. (2.69), Annona squamosa L. (2.72), Stachytarpheta jamaicensis (L.) Vahl (2.75), Crotalaria juncea L. (2.26), Caesalpinia pulcherrima (L.) Sw. (2.30), Cynodon dactylon (L.) Pers. (2.06), Cicer arietinum L. (1.87), and Ananas comosus (L.) Merr. (0.96).

These species are used less frequently and may represent localized or supplementary remedies with limited cultural diffusion.

This categorization highlights that a few species dominate traditional knowledge systems, particularly Plumbago zeylanica L., Justicia adhatoda L., Cleistanthus collinus (Roxb.) Benth. ex Hook. f., and Celastrus paniculatus Willd., which are highly valued for their efficacy and reliability. The medium-importance group represents plants with substantial but regionally variable use, while the low-importance group may reflect either declining traditions or niche practices (Table 2).

The predominance of high-RI species suggests that communities rely heavily on a limited set of plants for abortifacient purposes, ensuring consistency in knowledge transmission. However, the inclusion of species with lower FC and RI values also indicates ethnobotanical diversity, which could serve as a reservoir of lesser-known remedies that deserve further scientific exploration.

Table 2: FC, RFC and RI for Abortifacient plants

S. No.	Name of the Plant Species	FC	RFC	RI
1	Abrus precatorius L.	75.00	0.75	6.69
2	Ananas comosus (L.) Merr.	20.83	0.21	0.96
3	Annona squamosa L.	58.33	0.58	2.72
4	Asparagus racemosus Willd.	91.67	0.92	4.39
5	Caesalpinia pulcherrima (L.) Sw.	45.83	0.46	2.30
6	Cassia fistula L.	70.83	0.71	3.63
7	Celastrus paniculatus Willd.	95.83	0.96	5.10
8	Cicer arietium L.	33.33	0.33	1.87
9	Cleistanthus collinus (Roxb.) Benth. ex Hook. f.	91.67	0.92	5.24
10	Crotalaria juncea L.	37.50	0.38	2.26
11	Cynodon dactylon (L.) Pers.	33.33	0.33	2.06
12	Dolichandrone falcata (Wall. ex DC.) Seem.	54.17	0.54	3.41
13	Jatropha curcas L.	62.50	0.63	4.08
14	Justicia adhatoda L.	79.17	0.79	5.38
15	Plumbago zeylanica L.	83.33	0.83	5.99
16	Rhynchosia minima (L.) DC.	50.00	0.50	3.82
17	Sida acuta Burm. f.	45.83	0.46	3.64
18	Stachytarpheta jamaicensis (L.) Vahl	33.33	0.33	2.75
19	Uraria lagopodioides (L.) DC.	58.33	0.58	4.95

Preparation methods varied, including decoctions, pastes, and juice extractions, demonstrating sophisticated traditional knowledge in processing plant materials for therapeutic efficacy [10,9]. The frequent use of leaves may reflect lower toxicity and easier preparation compared to roots and seeds [17].

These findings highlight the significant role of indigenous knowledge in reproductive healthcare. The study also identifies species with potential for phytopharmacological research. Limitations include seasonal availability of plants, lack of standardized dosages, and ethical considerations surrounding abortifacient practices [6,8].

Conclusion

This ethnobotanical survey in Bhandara district documented 19 plant species used as abortifacients by tribal and rural communities. Quantitative analysis showed that species such as Plumbago zeylanica L., Justicia adhatoda L., Cleistanthus collinus (Roxb.) Benth. ex Hook. f., and Celastrus paniculatus Willd., hold the highest cultural importance, while others contribute supplementary roles. The predominance of dicotyledons, preference for leaves, and diversity of plant families underscore both the ecological and cultural importance of these species, providing a foundation for conservation and potential pharmacological exploration. The findings highlight the significance of traditional knowledge in reproductive healthcare and underscore the need for scientific validation and safety assessment of these plants to ensure their sustainable and safe use.

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