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ETHNOMEDICINAL USE OF PTERIDOPHYTES IN REPRODUCTIVE HEALTH OF TRIBAL WOMEN OF PACHMARHI BIOSPHERE RESERVE, MADHYA PRADESH, INDIA

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ABSTRACT

This paper describes the utilization of pteridophytes for the treatment of various gynecological and other related problems by the indigenous women of Pachmarhi Biosphere Reserve in Madhya Pradesh. The present study reveals that 23 species of pteridophytes belonging to 15 families and 18 genera are traditionally used by tribal women of *Korku*, *Gond*, *Bharia*, *Bhil*, *Mauria*, *Maria*, *Paria*, *Bhatara* and *Baigas* communities in gynecological problems which contribute about 18.66% of total pteridophytic diversity (134 species) of the area.

INTRODUCTION: Human beings have been utilizing plants for food, fiber and drugs apart from their well-being since time immemorial. In the modern technocratic world, the traditional system of medicine plays an important role in health care of urban, rural and tribal people for all types of ailments. As herbal use becomes more common throughout the world, ethnobotanical investigations can provide insight into other medical systems that differ from the biomedical model¹.

About 85% of traditional medicines used for primary healthcare globally derived from plants². In India, where current population is about 1,220, 200,000 according to last census 2011, an estimated 65% of Indian population still depend on the traditional medicine, because modern medicine is simply too expensive and treatment is too capital intensive. Another important reason may be the rare presence of allopathic doctors in tribal areas of the high mountains, the desert areas, or in the remote forests³.

Today traditional medicine and ethnobotanical information play an important role in scientific research. Ethnobotanical studies have become increasingly valuable in the development of health care and conservation programs in different parts of the world⁴.

Scientific research in traditional and indigenous medicine in India has continuously been increasing. Large number of medicinal plants and their therapeutic uses has been thoroughly investigated⁵. Unfortunately the lower plants are thought by most people to be quite non-productive members of the plant kingdom. Pteridophytes, being a group of lower vascular plants, it remains unattended and their useful aspects are largely ignored.



In comparison to angiospermous plants they have found little applications in medicine. However, the tribal communities, ethnic groups and folklore throughout the world are utilizing rhizome, stem, fronds, pinnae and spores of fern and fern-allies in different ways for the treatment of various ailments since ancient times. They have also been used for food, fiber, crafts, building materials, abrasives, decoration, and apart from their use as medicine⁶⁻¹⁵. Recently interest in ethno botanical studies of fern and their allies have attracted a number of researchers and they have supplied a lot of information about different uses worldwide¹⁶⁻²⁶.

Out of 1,200 species of pteridophytes occurring in India, about 170 species have been found to be used as food, flavor, dye, medicine, bio-fertilizers, oil, fiber and bio-gas production²⁷. Ethnobotany and medicinal properties of Indian fern and their allies have been described by various workers time to time²⁸⁻³². Likewise 160 species of useful pteridophytes in India on the basis of phytochemical, pharmacological and ethnobotanical studies have been reported³³. An overview on medicinal uses of 110 Indian pteridophytic has been published³⁴. Likewise the antimicrobial and antibacterial potential of some ferns has been studied³⁵⁻³⁸. The medicinal value of pteridophytes against bacteria, fungi, virus, cancer rheumatism, diabetes, inflammation, consultant, fertility, diuretic, pesticides, hepato-protective, and sedative had been reported. Besides sugar, starch, proteins and amino acids, ferns contain a variety of alkaloids, glycosides, flavonoids, terpenoids, sterols, phenols sesquiterpens etc. as potential components used in various industries³⁹.

Ethnobotanical studies and surveys of Central India have been mainly confined on flowering/higher plants and very few efforts have been made so far to explore medicinal properties of pteridophytes⁴⁰. The numbers of contributions about the taxonomy, ecology and distribution of pteridophytes have been published time to time in various ways but enough attention has not been paid towards their useful aspects. During past years extensive survey in connection with systematics and ethnobotany of pteridophytic biodiversity, in different parts of Pachmarhi Biosphere Reserve and adjoin area has been explored by various researchers⁴¹⁻⁴².

A total 134 ferns and fern allies have been reported from Central India, out of which 119 species are from Pachmarhi Biosphere Reserve, Madhya Pradesh⁴³⁻⁴⁷. Ethnobotany and economic uses of some ferns and their allies of Satpura Hills has been described⁴⁸⁻⁵⁰. Recently 59 species of ethnomedicinal useful pteridophytes have been reported from Central India including Pachmarhi Biosphere Reserve⁵¹⁻⁵³. After that 31 ethnobotanical uses species of ferns of Pachmarhi hills have been compiled⁵⁴.

The Pachmarhi Biosphere Reserve (Fig.2iii) lies in between latitude 22° 11' to 22° 56' N and 77° 47' to 78° 52' E longitude and covers three districts namely Hoshangabad, Betul and Chhindwara of the Madhya Pradesh state (Fig.2ii). The total area is 4987.38 sq. km which envelops three wildlife conservation areas Bori Sanctuary (485.72 sq. km), Satpura National Park (524.37 sq. km), and Pachmarhi Sanctuary (417.78 sq km), having an altitude range from 320 to 1352m.

The average annual rainfall is about 200–250 cm. It is one of the highly biodiversity rich areas with high floristic diversity and unique plant life forms because of the varied spectrum variations of the latitude, altitude, rainfall, topography, soil type and other climatic aspects. Total area links two biological hot spots of the country which are Eastern Himalayas and Western Ghats and also act as confluence of northern and southern type of vegetation⁵⁵⁻⁵⁶. It is a natural junction of two most important timber species of India, Teak and Sal.

Pachmarhi forests can be broadly classified into three major types which are (1) moist deciduous, (2) dry deciduous and (3) central Indian sub-tropical hill forest⁵⁷. Pteridophytes are most prevalent in sub-tropical hills forest of Pachmarhi. Perennial streams and dark shady gorges encourage the growth of moisture loving species of pteridophytes, along with rare herbs in the area. The area is generally perceived as a tribal dominated area. Many ethnic groups and folklore like *Gond*, *Korku*, *Bharia*, *Bhil* and *Mabasi* inhabit in and around the Reserve. They are largely dependent upon the use of traditional medicines to cure diseases and various ailments from which they suffer⁵⁸. In turn they protect the forests, conserve its diversity, and also enrich fertility with various cultural activities.

Traditionally, the rural and tribal women of this area mostly prefer plant medicines rather than modern medicines for their gynecological problems. Most of the gynecological problems can be attributed to unhygienic living conditions, malnutrition and hard physical work, often during pregnancy. Traditional healers and ethnic women have been using many of the locally available plant species including pteridophytes to cure gynecological disorders like abortifacients, excessive-bleeding (hypermenorrhea), painful menstruation (dysmenorrhoea), irregular menstruation, amenorrhea, leucorrhoea, prolapsed uterus, for abortion and to reduce sterility in women.

Keeping the aforesaid facts in view, the present study was undertaken with the aim of enlisting the pteridophytic species and their uses in gynecologically problem used by the tribal communities in Pachmarhi Biosphere Reserve. The study also motivates the farmers for the sustainable use, cultivation of selected species which are subjected to over harvesting and preservation of traditional knowledge and conservation of these pteridophytes.

MATERIALS AND METHOD: The data presented are based on the first hand information collected during the period in months of October and November 2011. The present study is the outcome of the critical field survey, sample collection and literature survey. The data were collected according to the methodology suggested by Jain⁵⁸⁻⁶⁰. The ethnobotanical data (local name, mode of preparation of medicines and their uses in gynecological problems) were collected through questionnaire, interviews and discussions among village chiefs, traditional healers / *Vadhya* and local old women of *Gond*, *Korku*, *Bharia*, *Bhil* and *Mabasi* ethnic groups (**Fig. 1vii & viii**).

The collected information about mode of preparation (i.e., decoction, paste, powder and juice), form of usage either fresh or dried and mixtures of other ingredients like honey, water and curd has been tabulated (**Table 1, 2**). Surveys were conducted in different villages like Shahwan, Fatehpur, Singhpur, Anthoni, Bandi, Deokoh, Bodalkachhar, Khara and Taperwani and localities like Bara Mahadeo, Chauragarh, Vanushree Vihar, Dhupgarh, Jamboodweep, Bee Fall, Dutches Fall, Rorighat, Bori, Panarpani, Gupt Mahadev, Rajendra Giri, Patharchatta,

Madai, Tawa Dam, Naagdware and Matkuli in and around the Pachmarhi Biosphere Reserve during various seasons. The voucher specimens in duplicate were deposited in the herbarium of the Biosystematics Lab, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi, India.

RESULTS AND DISCUSSION: A total of 23 plant species belonging to the 18 genera in 15 families used in treating 16 different gynecological/reproductive health related diseases by the tribal women of *Gond*, *Korku*, *Bharia*, *Bhil* and *Mabasi* communities of Pachmarhi Biosphere Reserve which contribute to about 18.66% of total pteridophytic diversity (134 species) of the area. The medicines obtained from these ferns are used during pregnancy (antenatal), at delivery, and after delivery (post-partum) and are presented in **Tables 1 & 2** and **graph (Fig. 3i)**.

They show a summary of the plant species, their local names, family, gynecological diseases, morphological characters and mode of administration. Oral consumption is the most frequently employed route of administration while inhalation appeared to be the least preferred route of administration. All plant parts such as rhizomes, tubers, fronds, leaves, stem and spores are used as medicine (**Fig. 1ix**). Leaves were the most popular plant part utilized in herbal preparations (37%), rhizome (26%), whole plant (23%) while fronds (including spores) were used infrequently (14%) (**Fig. 3iii**). Out of 23 species of ferns utilized for the herbal preparation *ca* 52% are common, 26% are occasional and only 22% are rare to the area (**Fig. 3v**). On the basis of the occurrence of the plant habit 12 species are terrestrial, 9 are lithophytes, 2 are epiphytes on tree and only one is climber (**Fig. 3iv**).

The approach adopted in documenting ethnogynecological use of pteridophytes is a vital issue with the potential to enhance research and development. This study adopted an approach focusing on fern and fern allies used for female reproductive disorders in Pachmarhi Biosphere Reserve. Since among 15 families of fern and fern allies in the area the most common family reported in this study is Pteridaceae (5 species) while Selaginellaceae (3 species) and families Davalliaceae and Aspleniaceae represented 2 species each (**Fig. 3ii**).



FIGURE 1: (i) *Adiantum philippense* L.; (ii) *Alsophila gigantea* Wall. ex Hook.; (iii) *Cheilanthes farinosa* (Forssk.) Kaulf.; (iv) *Dicranopteris linearis* (Brum. f.) Underw.; (v) *Osmunda regalis* L.; (vi) *Equisetum ramosissimum* Desf. ssp.debile; (vii) Interaction with local healer; (viii) Parts sold in the local markets; (ix) Rhizome of *Dryopteris cochleata* (D. Don) C. Chr.

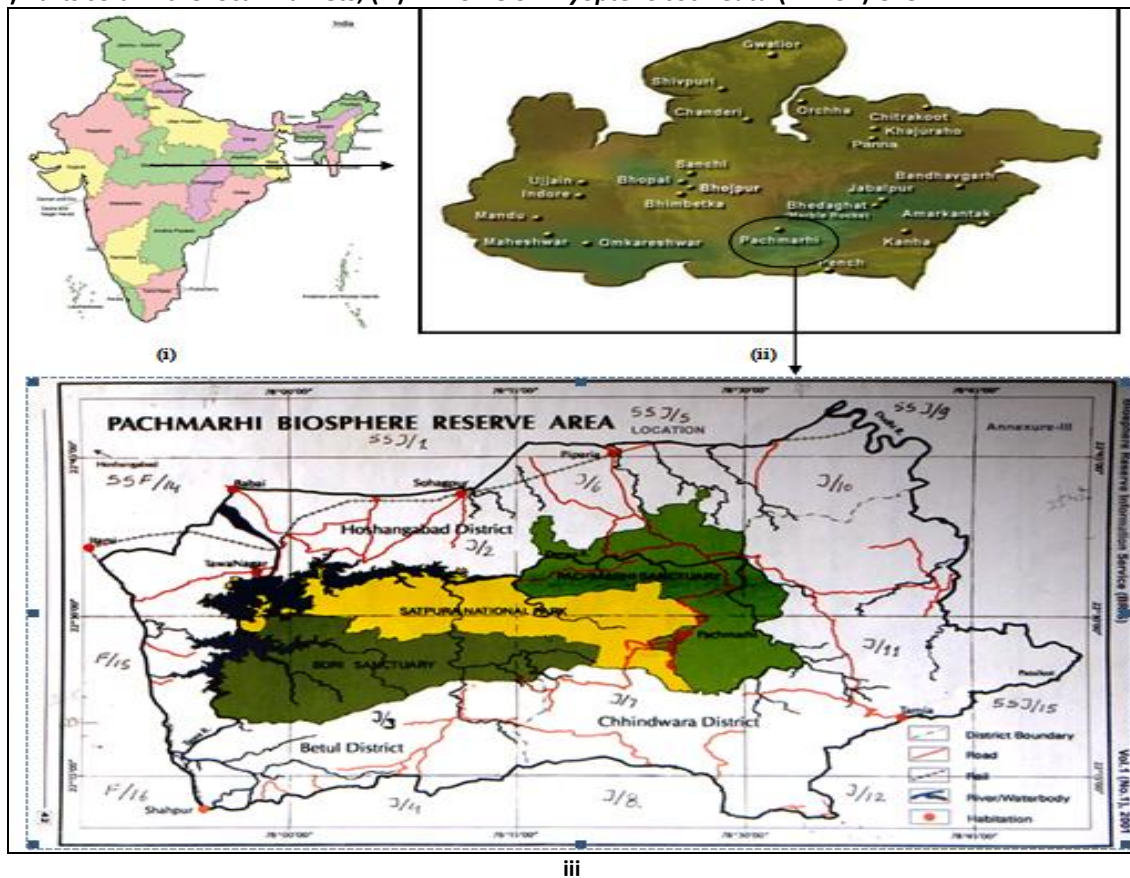
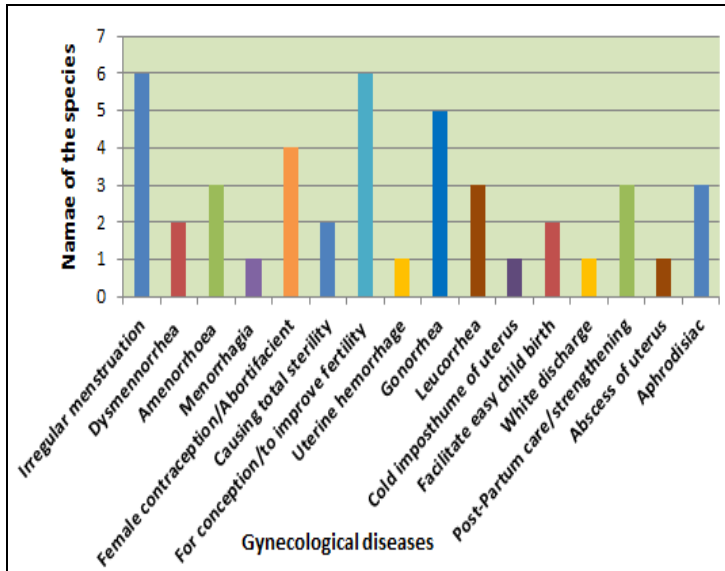
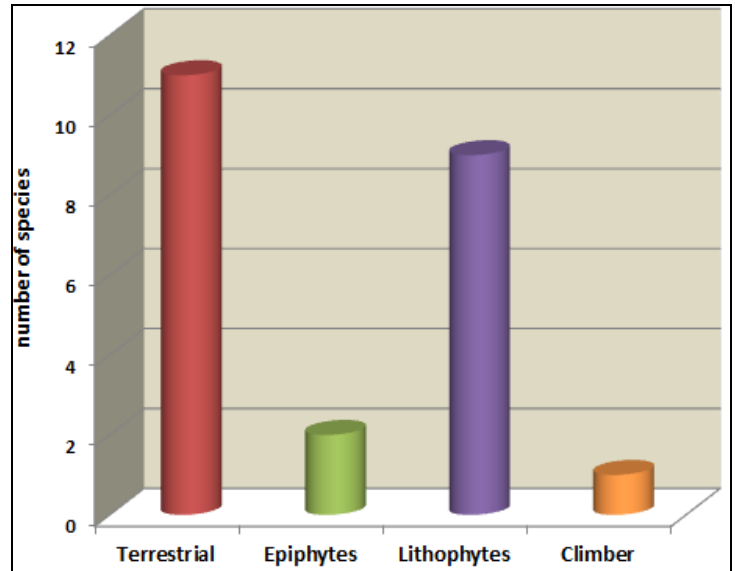


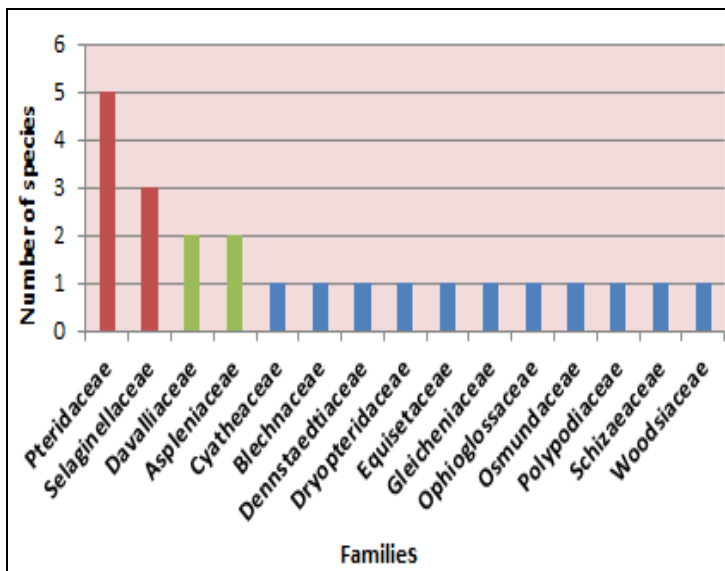
FIGURE 2: (I) POLITICAL MAP OF INDIA; (II) MAP OF MADHYA PRADESH SHOWING PACHMARHI BIOSPHERE RESERVE; (III) MAP OF PACHMARHI BIOSPHERE RESERVE AREA



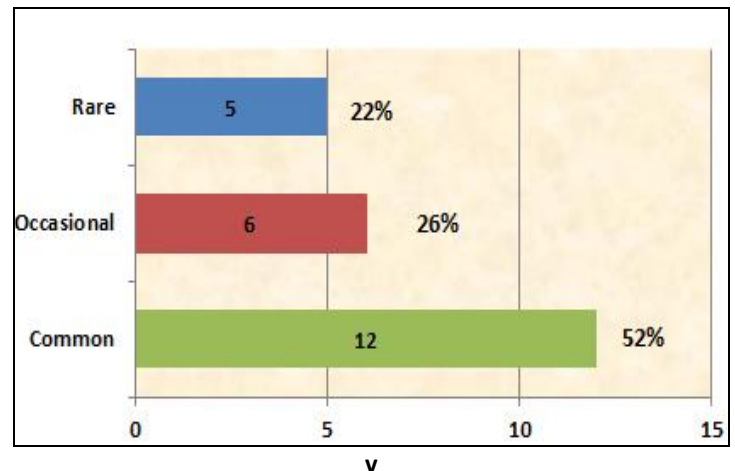
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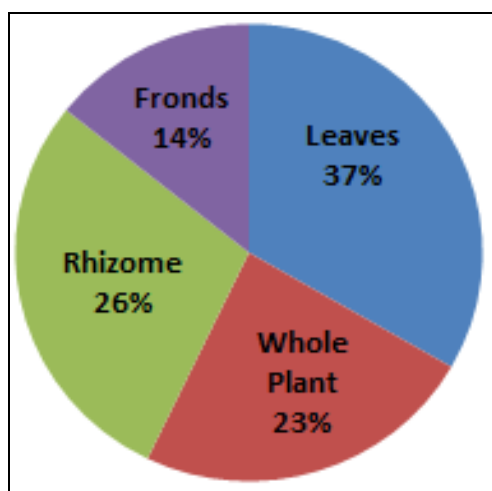
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(i) Number of species cited for the treatment of gynecological disorders; (ii) Frequency of species in the families; (iii) Statistics of different plant parts; (iv) Occurrence of the plant habit used in treating gynecological diseases; (v) Frequency of occurrence of the plant species

This approach allows for a clear identification of untouched areas in the documentation of ethno-medicinal uses of plants that require urgent attention and prevents duplication of efforts. Thus, the information collected from different groups of tribal people for the same problem would not only be documented in biological register but can be comparatively analyzed with ease providing further information as to similarity, differences or frequency with which a particular species is used for the same problem which is a good indication of efficacy⁶¹. This study also infers the significant role of tribal women who are utilizing and conserving the pteridophytic biodiversity in the localities of their natural habitat.

They are found to be more familiar with the use of various medicinal plant including pteridophytes. It is apparent that the community is rich in ethnomedicinal knowledge and is being transmitted from generation to generation. It has been found that some individuals have become specialized in the preparation of the medicines from these pteridophytes owing to prolonged practical experience. This information handed down from generation to generation is rich in domestic recipes and communal practice. This data can be used in future for more studies and research on pharmacological and clinical level. Furthermore,

research related to chemical screening may also be initiated to analyses the chemical contents of medicinal plants and the implications on health. In addition to medicinal use, plant resources can be linked to the preservation of biodiversity and alleviation of poverty by involving them in utilization and conservation of pteridophytic biodiversity and in overall support for forest conservation. Excessive collection, rapid urbanization and biotic interference has disturbing impact on all natural habitats; therefore an urgent need was felt to study and document this precious knowledge for posterity.

PTERIDOPHYTES USED BY TRIBAL WOMEN IN GYNECOLOGICAL PROBLEMS

TABLE 1

S. No.	Botanical name	Local name	Morphological characters	Family	Mode of administration
1.	<i>Actiniopteris radiata</i> (Sw.) Link (Voucher No. 2501)	Mayurshikh, Morpamkhi	Small xerophytic plant, lamina fan-like with dichotomously segments and rooting in rocky soil long roadside usually in lime rich/alluvial soil.	Pteridaceae	Fresh paste/dried powder of leaves (5-6) with 1 tsp. honey is used orally twice a day to treat leucorrhoea and increase fertility ⁶² . 5-6 fresh leaves mixed with fresh cow milk ($\pm 180-200$ ml) is taken once a day for a week or the leaves ash ($\pm 2-3$ g) mixed with fresh cow milk (200 ml) is given to lady for a night after menses for conception. 5-6 leaves with sugar is used orally for twice a day, as aphrodisiac substance and strength tonic to increasing the potency in women ³⁷ .
2.	<i>Adiantum capillus-veneris</i> L. (Voucher No. 2506)	Hansraj, Southern maiden hair fern, Venus hair fern	Small or medium sized lithophyte with short-creeping dark brown, densely scaly rhizome. Plants grow in crevices of shady rocks and forms dense clusters.	Pteridaceae	Decoction (2-3 tsp.) of fresh fronds along with water/tea used in the treatment of abnormal/ irregular stoppage of menses/emmenagogue, cold imposthumes of uterus and to facilitate childbirth ⁵⁰⁻⁵³ . Whole plant is used as aphrodisiac ¹⁵ .
3.	<i>Adiantum philippense</i> L. (Voucher No. 2509) (Fig.1i)	Kalijhant	Medium sized lithophyte and growing on rock boulders along streams in hilly regions or under heavy rock boulders.	Pteridaceae	2-3 tsp. of powder of dries rhizome mixed with water is used orally once for 3-5 days during menstrual period for contraception by tribal women. 2-3 tsp. of decoction of fresh fronds used in abnormal/ irregular stoppage of menses ⁵¹⁻⁵³ .
4.	<i>Alsophila gigantea</i> Wall. ex Hook. (Voucher No. 2515) (Fig.1ii)	Bina kantewala Tree Fern	1-3 m tall tree fern with short stout trunk. Fronds pinnate, huge, tufted, compound. Sori arranged in 'V' inverted shaped, grow along the water channels in humid situations. Rare.	Cyatheaceae	10g fresh rhizome mixed with 1g black pepper seed (<i>piper nigrum</i>) powder, used orally with cow milk twice a day for a week in empty stomach against white discharge in women ⁶³ .
5.	<i>Asplenium trichomanes</i> L. (Voucher No. 2534)	Do patiya Chhoti	A small terrestrial fern, covered with dark scale, fronds tufted and growing on rocks deep into the forest. Rare.	Aspleniaceae	Decoction of fresh/dried plant (2-3 tsp./5 ml) used in abscess of uterus. 1 tsp. of dried fronds used orally for a week to promote menstruation ⁶⁴ .
6.	<i>Asplenium yoshinagae</i>	Do patiya badi	Epiphytic. Rhizome short, erect, scaly. Lamina narrowly	Aspleniaceae	5g fresh rhizome paste mixed with 10 ml milk administrated thrice a day for 7-10

	Makino var. planicaule (Wall. ex Mett.) Morton (Voucher No. 2530)		lanceolate. Growing on mossy tree-trunks in dense forests at altitudes above 1300 m.		days for treatment of gonorrhoea ⁶³ .
7.	Blechnum orientale L. (Voucher No. 2510)	<i>Hastajori, Shield Fern</i>	A terrestrial, frond large. Plants growing along the ponds and streams in the forest edges.	Blechnaceae	Complete sterility is claimed by tribal women who eat the top new leaf of this fern for 3 days, then wait 2 weeks before repeating the treatment ⁶⁵ .
8.	Cheilanthes farinosa (Forsk.) Kaulf. (Voucher No. 2518) (Fig.1iii)	<i>Chandi booti, Nanha, Silver fern</i>	Small xerophytic fern rooting in rock crevices or under heavy rock boulders, along newly constructed roads, in lime rich soil.	Pteridaceae	Decoction (10-15 ml) of fronds used orally for a week to treat irregular menstruation ⁶⁰ .
9.	Dicranopteris linearis (Brum. f.) Underw. (Voucher No. 2525) (Fig.1iv)	<i>Rajhans, Thicket fern</i>	Terrestrial, widely spreading and sub scandent fern rooting on rock boulders with little humus soil, along flowing streams, in exposed places forming thickets.	Gleicheniaceae	Paste of 10-15g. of young fronds along with warm cow's milk used by tribal women for a month to improve fertility power ⁵⁰⁻⁵³ .
10.	Dryopteris cochleata (D. Don) C. Chr. (Voucher No. 2545)	<i>Kakolisag, Jatashankari</i>	Lithophytes; Medium or large sized plants with densely scaly rhizome, fronds dimorphic, commonly grows in shady places on forest slopes and forest floor.	Dryopteridaceae	Whole plant extract (10-15 ml) is used as cooling medicine for gonorrhoea ⁵⁰ .
11.	Equisetum ramosissimum Desf. ssp. debile (Roxb. ex Vauch) Hauch (Voucher No. 2520) (Fig.1v)	<i>Had-jod,</i>	Large terrestrial to sub aquatic perennial plants, growing in shady or open moist / wet places preferring sandy-alluvial soil at lower elevations, trailing through bushes.	Equisetaceae	10-15 ml of decoction of rhizome used orally for 7-14 days in gonorrhoea. The same dose is taken orally twice a day for a month to facilitate fertilization in women. ⁵⁰⁻⁵³ .
12.	Hypodematium crenatum (Forssk.) Kuhn (Voucher No. 2544)	<i>Bhoot Kesari, Jaributti</i>	Terrestrial fern, herbaceous and growing among rocks along stream.	Woodsiaceae	Chewing 5-10 g. of leaves/ dry powder along with fresh cow milk is taken, after five days of menstrual period for about a week used to facilitate conception in Women ^{15, 50-53} .
13.	Lygodium flexuosum (L.) Sw. (Voucher No. 2562)	<i>Kalijar, Climbing fern</i>	Climbing ferns growing along the edges of forest, roadsides and climbing on bushes and trees or trailing on the ground, rooting in gravelly, sandy soil near streams.	Schizaeaceae	An infusion (1/2 cup/10-15 ml) of plant is used in menorrhagia for 5-7 days and treating female infertility. Aqueous rhizome extract (10-15 ml) is used orally for two weeks to treat gonorrhoea and dysmenorrhoea. ^{11, 51-53} .
14.	Nephrolepis cordifolia (L.) C. Presl (Voucher No. 2555)	<i>Nechii, Ladder fern</i>	A medium sized terrestrial fern, tufted, wiry and growing along streams and nalas in sunny situations.	Davalliaceae	Extract (10-15 ml) of rhizome is used once during menstrual period to cause permanent sterility in women. Used as contraceptive ^{23, 11, 51, 53, 66} .
15.	Nephrolepis exaltata (L.) Schott (Voucher No. 2511)	<i>Fish bone fern</i>	A medium sized lithophytic fern, growing along streams and nalas on rocks in sunny places.	Davalliaceae	10-15 ml of rhizome extract used against women sterility for a month. It is also used in treatment of menstrual disorders and Birth-aid in parturition ⁶⁷ .

16.	<i>Osmunda regalis</i> L. (Voucher No. 2503) (Fig.1vi)	<i>Royal fern</i>	Terrestrial plants abundantly grow in exposed marshy places, in humid slope near water fall on sandy loam soil.	Osmundaceae	Decoction (10 ml) of rhizome used twice a day as abortifacient. On other hand the paste of 8-10 leaves mixed with thin curd (\pm 250 ml) is given for birth control ⁶⁰ .
17.	<i>Ophioglossum reticulatum</i> L. (Voucher No. 2504)	<i>Van palak, Brahmi fern</i>	Terrestrial plants, growing in amidst grasses/mosses, etc. or in moist alluvial, sandy soil along flowing streams. This seems to be one of the most common and polymorphic species since a number of intermediate forms with various interlinked shapes of tropophyll are observed.	Ophioglossaceae	0.5 g fresh leaves along with 100 g rice are boiled and taken orally in empty stomach for 15-20 days against menstrual disorders. Decoction (10 ml) of whole plant is taken orally ones in day for 15 days in Urine hemorrhage and Leucorrhoea. It is given to the women after child birth. The traditional healers used this 'sag' helps in preventing the body from infection. Also used as strength tonic for women ^{63, 68-69} .
18.	<i>Parahemionitis cordata</i> (Hook. & Grev.) Fraser-Jenk. (Voucher No. 2528)	<i>Rabbit ear fern, Chakuliya.</i>	Small terrestrial tufted fern, rooting in rock crevices along flowing streams.	Pteridaceae	Decoction (10 ml) of whole plant is taken orally ones in a day against dysmenorrhoea (painful menstruation) for two weeks ¹⁵ .
19.	<i>Pleopeltis macrocarpa</i> (Bory ex Willd.) Kaulf. (Voucher No. 2529)		Plants epiphytic on trees, shrubs and on moist rock boulders in moist shady places in the deep forest.	Polypodiaceae	Decoction (1/2 cup/10-15 ml) of entire plant taken orally in night causing abortion (abortifacient) ⁷⁰ .
20.	<i>Pteridium aquilinum</i> (L.) Kuhn (Voucher No. 2548)	<i>Common bracken</i>	1-2m tall terrestrial perennial plant. Growing in hilly region along stream-side and in shady situation on the forest floor, Rare.	Dennstaedtiaceae	The rhizome together with the rhizome of ginger is pounded and juice is drunk as an aphrodisiac ⁷¹ .
21.	<i>Selaginella bryopteris</i> (L.) Bak. (Voucher No. 2537)	<i>Sanjeevani</i>	Xerophytic plant growing on heavy rock boulders forming thick, green carpet during rainy season. Leaves curled up in dry weather but retain original colour and shape if dipped upside down in water for some time.	Selaginellaceae	Single tsp. of fresh leave paste is given twice a day in gonorrhoea and other venereal diseases (spermatorrhoea and leucorrhoea) ⁵¹⁻⁵³ .
22.	<i>Selaginella ciliaris</i> (Retz.) Spring (Voucher No. 2560)	<i>Chhoti sanjeevan</i>	Small tiny lithophytic plants, ciliated at base and rooting in rock crevices along streams with permanent source of trickling water. It is one of the common species.	Selaginellaceae	Decoction (10-15 ml) of fresh plant or paste (1 tsp.) is taken orally twice a day for two weeks against amenorrhoea. ⁵¹ .
23.	<i>Selaginella involvens</i> (Sw.) Spring (Voucher No. 2512)		Lithophytic herbaceous annual/perennial, stem dichotomously branched. Growing on heavy rock boulders. Leaves dried up during dry weather and retain original colour and shape in raining season.	Selaginellaceae	Paste of fresh leaves (1 tsp.) is taken orally twice a day for 1-2 weeks against amenorrhoea. ^{33, 51} .

TABLE 2

S. No.	Gynecological problems / Reproductive health related disease	Botanical name	Part used
1.	Irregular menstruation	(1) <i>Adiantum capillus-veneris</i> L. (2) <i>Adiantum philippense</i> L. (3) <i>Asplenium trichomanes</i> L. (4) <i>Cheilanthes farinosa</i> (Forssk.) Kaulf. (5) <i>Nephrolepis exaltata</i> (L.) Schott (6) <i>Ophioglossum reticulatum</i> L.	Fronds Fronds Whole plant Leaves Rhizome Leaves
2.	Dysmenorrhea (painful menstruation)	(1) <i>Parahemionitis cordata</i> (Roxb. ex Hook. & Grev.) Fraser-Jenk. (2) <i>Lygodium flexuosum</i> (L.) Sw.	Whole plant Rhizome
3.	Amenorrhoea / Emmenagogue (absence or suppression of normal menstrual flow)	(1) <i>Adiantum capillus-veneris</i> L. (2) <i>Selaginella ciliaris</i> (Retz.) Spring (3) <i>Selaginella involvens</i> (Sw.) Spring	Fronds Leaves Leaves
4.	Menorrhagia (heavy menstrual bleeding)	(1) <i>Lygodium flexuosum</i> (L.) Sw.	Whole plant
5.	Female contraception / Abortifacient	(1) <i>Adiantum capillus-veneris</i> L. (2) <i>Adiantum philippense</i> L. (3) <i>Osmunda regalis</i> L. (4) <i>Pleopeltis macrocarpa</i> (Bory ex Willd.) Kaulf.	Fronds Rhizome Leaves Whole plants
6.	Causing total sterility	(1) <i>Blechnum orientale</i> L. (2) <i>Nephrolepis cordifolia</i> (L.) Presl	Fronds Rhizome
7.	For conception / to remove infertility	(1) <i>Actiniopteris radicata</i> (Sw.) Link (2) <i>Dicranopteris linearis</i> (Brum. f.) Underw. (3) <i>Equisetum ramosissimum</i> Desf. ssp. <i>debile</i> (4) <i>Hypodematium crenatum</i> (Forssk.) Kuhn. v Desk (5) <i>Lygodium flexuosum</i> (L.) Sw. (6) <i>Nephrolepis exaltata</i> (L.) Schott	Leaves Fronds Rhizome Leaves Whole plant Rhizome
8.	Uterine hemorrhage	(1) <i>Ophioglossum reticulatum</i> L.	Whole plants
9.	Gonorrhoea	(1) <i>Asplenium yoshinagae</i> Makino var. <i>planicaule</i> (2) <i>Dryopteris cochleata</i> (D. Don) C. Chr. (3) <i>Equisetum ramosissimum</i> Desf. ssp. <i>debile</i> (4) <i>Lygodium flexuosum</i> (L.) Sw. (5) <i>Selaginella bryopteris</i> (L.) Bak.	Rhizome Whole plant Rhizome Rhizome Leaves
10.	Leucorrhoea	(1) <i>Actiniopteris radicata</i> (Sw.) Link (2) <i>Ophioglossum reticulatum</i> L. (3) <i>Selaginella bryopteris</i> (L.) Bak.	Leaves Whole plants Leaves
11.	Cold imposthume of uterus	(1) <i>Adiantum capillus-veneris</i> L.	Fronds
12.	Birth-aid in parturition/ Facilitate easy child birth	(1) <i>Diplazium esculentum</i> (Retz.) Sw. (2) <i>Nephrolepis exaltata</i> (L.) Schott	Leaves Rhizome
13.	White discharge	(1) <i>Alsophila gigantea</i> Wall. ex Hook.	Rhizome
14.	Post-Partum care/strengthening	(1) <i>Actiniopteris radicata</i> (Sw.) Link (2) <i>Selaginella bryopteris</i> (L.) Bak. (3) <i>Ophioglossum reticulatum</i> L.	Leaves Leaves Leaves
15.	Abscess of uterus	(1) <i>Asplenium trichomanes</i> L.	Whole plants
16.	Aphrodisiac	(1) <i>Actiniopteris radicata</i> (Sw.) Link. (2) <i>Adiantum capillus-veneris</i> L. (3) <i>Pteridium aquilinum</i> (L.) Kuhn	Leaves Leaves Whole plants

CONCLUSION: Man has exploited all groups of plants including pteridophytes for medicinal and traditional uses. However, an intensive study is required to search for the factors threatening the transmission of ethnomedicinal knowledge and the fast disappearance of rare pteridophytic species.

The first step to overcoming this challenge and improving on the drawbacks associated with ethnomedicinal studies is an intensive documentation of indigenous knowledge. The documentation of collected data should be more focused, specialized and subjected to a non-experimental validation, as an

indication of efficacy can enhance the search for natural plant products⁷². After documentation the next step should be an experimental validation of efficacy and establishment of effective dosage. The public awareness program should be start for cultivation of wild medicinal pteridophytes. This would encourage in the conservation and the production of improved varieties. Ethnobotanical knowledge if recognized, valued and implemented properly can conserve the biodiversity and help the environment and society in a holistic way.

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