

---

## PTERIDOPHYTES AND HUMAN HEALTH: THE ETHANOBOTANICAL STUDY OF MEDICINALLY USED FERNS AND FERN ALLIES

Sanjay Kumar<sup>1</sup>. J.N. Pant<sup>1\*</sup> and Sachin Pandey<sup>2</sup>

1-Department of Botany, M.B.P.G College, Haldwani 263139

2-Department of Botany, Govt. P.G. College, Berinag 262531

---

### ARTICLE DETAILS

**Research Paper**

**Keywords:**

*Western Himalaya, Ethno-botany, fern allies, Traditional medicine*

---

### ABSTRACT

The study of ethano-medicine focuses on conventional medical practices. It includes investigating the kinds of plants and how indigenous peoples use them. This study explains the diverse medicinal applications of ferns and their associates used by the indigenous inhabitants of the Himalayan regions to cure a wide range of illnesses. The information was gathered from them and other sources. Finding out what pteridophyte the native peoples use as a medicine is the main objective of the study. The survey were carried out in year 2022-2023 .Twenty noteworthy species of medicinal fern were collected and all relevant information about species is provided, along with information on its genus, family, potential medical uses, parts utilized for medical purposes, application methods and their use and possible health advantages.

---

### INTRODUCTION

The oldest classes of terrestrial plants on earth are pteridophytes. Owing to their rich leaf pattern, they are commonly used as ornamental plants; some are even used as bio-fertilizers while others are used as pollution markers. Despite the fact that ferns and their associates frequently serve few useful uses for humans, research on ethno-botanical studies has garnered significant attention and has produced a vast quantity of knowledge regarding the many uses of plants across the world. Approximately 304 different

species of pteridophyte may be found in the Kumaon area, which is one of India's florally richest locations. Due to this, the Kumaon region was selected for ethno-botanical study, with the aim of gathering traditional knowledge about the various uses of plants that our ancestors have labored to acquire. For tolerance and defense, pteridophyte develops a variety of secondary metabolites. Some compounds originating from plants have biological activity and are used as medications. Many ethnic groups that inhabit mountainous areas have been using plants for centuries. These groups have a distinct cultural history, knowledge base, and traditional medical practices that are essential to the treatment of many diseases among tribal populations without having any adverse effects.

## **METHODOLOGY**

### **Field investigation and data collection-**

The two year field survey, which covered the Namik region near the Ramganga river catchment area, spanning from Thal to Namik in Kumaon-Himalaya, was carried out and the result of survey presented in the current paper, all the essential data were gathered. To make identification and habitat recognition simple, photographs has been taken. All pteridophytes were identified using the literature, including those that Khullar, S.P (1994 & 2000), Pande and Pande (2002), Fraser-Jenkins (2017), (2018).

### **Consultation with the local community-**

The locals were consulted in order to understand how the plant resources are utilized and how dependent they were on it to cure variety of illness and for other useful reasons.

**Table1: Listing Family, Genus, Species name, Plant part used as medicine and Medicinal Importance.**

S.No-	NAME OF FAMILY	OF	NAME OF GENUS	NAME OF SPECIES	PLANT PARTS	MEDICINAL IMPORTANCE
01 -	PTERIDACEAE		<i>Adiantum</i>	<i>Adiantum capillus-veneris.</i>	Leaves & Stem	<i>Astringent.</i>
02 -	PTERIDACEAE		<i>Adiantum</i>	<i>Adiantum caudatum.</i>	Leaves	<i>Skin burn.</i>
03 -	PTERIDACEAE		<i>Adiantum</i>	<i>Adiantum incisum.</i>	Whole plant	<i>Treat UTI,</i>

				<i>Dysentery.</i>
04 –WOODSIACEAE	<i>Deplazium</i>	<i>Deplazium esculantum.</i>	<i>Stem</i>	<i>Astringent, To cure cough.</i>
05 -ASPLENIACEAE	<i>Asplenium</i>	<i>Asplenium trichomanes.</i>	<i>Leaves</i>	<i>Laxative.</i>
06 -BLECHNACEAE	<i>Woodwardia</i>	<i>Woodwardia unigemmata.</i>	<i>Rhizome &amp; Fron</i>	<i>Anti-Oxidant.</i>
07 DENNSTAEDTIACEAE	<i>Pteridium</i>	<i>Pteridium aquilinum.</i>	<i>Rhizome</i>	<i>Antiseptic, Anti- inflammatory.</i>
08-GLEICHENIACEAE	<i>Dicranopteris</i>	<i>Dicranopteris linearis</i>	<i>Fron</i>	<i>Asthma. Anti-microbial Activity.</i>
09-LINDSAEACEAE	<i>Odontosoria</i>	<i>Odontosoria chinensis</i>	<i>Fron</i>	<i>Musculoskeletal Pain &amp; Diuretic.</i>
10 -LYCOPODIACEAE	<i>Lycopodium</i>	<i>Lycopodium japonicum.</i>	<i>Whole plant</i>	<i>Skin disorders. Joint pain. Anti- inflammatory.</i>
11 -LYGODIACEAE	<i>Lygodium</i>	<i>Lygodium flexuosum.</i>	<i>Leaves &amp; &amp; Rhizome</i>	<i>Paste of Rhizome used to treat piles. Antiulcer.</i>
12- NEPHROLEPIDACEAE	<i>Nephrolepis</i>	<i>Nephrolepis cordifolia.</i>	<i>Leaves</i>	<i>To stop excessive Bleeding from wound.</i>
13 -OPHIOGLOSSACEAE	<i>Botrychium</i>	<i>Botrychium ternatum</i>	<i>Rhizome</i>	<i>Dysentery.</i>
14 -OPHIOGLOSSACAE	<i>Ophioglossum</i>	<i>Ophioglossum reticulatum.</i>	<i>Leaves</i>	<i>Antispasmodic.</i>
15 -OSMUNDACEAE	<i>Osmunda</i>	<i>Osmunda regalis.</i>	<i>Leaves &amp; Rhizome</i>	<i>Rheumatism</i>
16 -POLYPODIACEAE	<i>Pyrrosia</i>	<i>Pyrrosia lanceolata.</i>	<i>Leaves</i>	<i>Itching &amp;</i>

				<i>Irritation.</i>
17 -PTERIDACEAE	<i>Pteris</i>	<i>Pteris wallichiana.</i>	<i>Fronde</i>	<i>Treat Skin disease/</i>
18 -SELAGINELLACEAE	<i>Selaginella</i>	<i>Selaginella bryopteris.</i>	<i>Whole plant</i>	<i>Muscular Weakness.</i>
19 –PTERIDACEAE	<i>Aleuritopteris</i>	<i>Aleuritopteris bicolor.</i>	<i>Fronde &amp; Rhizome</i>	<i>Antiseptic.</i>
20- THELYPTERIDACEAE	<i>Thelypteris</i>	<i>Thelypteris arida</i>	<i>Fronde</i>	<i>Wound healing.</i>

Family name- Pteridaceae Ching in 1982.

(i) Genus- Adiantum (L.) 1753

Species- *Adiantum capillus-veneris* Linn.1753.

Habitat- frequent species that are reported to flourish in damp, humid environments.

Part used-Leaves and Stem.

Medicinal importance- frond has an Astringent effect (tissue contraction).

Expectorant (loosen the mucous and by loosen the mucous expectorants increase the output of your cough).

Stimulant (Accelerate neuronal and physiological activity).

(ii) Genus- Adiantum (L.) 1753.

Species- *Adiantum caudatum* (L.) 1753.

Habitat-Grows mostly on walls close to homes.

Part used- Leaves.

Medicinal importance- External use of leaf paste is used to treat wounds, cuts, and skin burn.

(iii) Genus- Adiantum (L.) 1753.

Species- *Adiantum incisum* forsk 1775.

Habitat- Grows mostly on walls close to homes.

Part used- Whole plant.

Medicinal importance- Plant that treats urinary tract problems.

Also used to treat Dysentery (intestinal disorder).

Family name- Woodsiaceae Ching ex Herter in 1949.

Genus- Deplazium Swartz 1801.

Species- *Deplazium esculantum* (Retz) Presl 1825

Habitat- Thrives mostly near water sources in low-altitude regions.

Part used- Stem.

Medicinal importance- used to get rid of cough. And also having analgesic property (to relief pain).

Family name- Aspleniaceae Mett. Ex Frank 1877.

Genus- Asplenium (L.) 1753.

Species- *Asplenium trichomanes* (L.) 1753.

Habitat- Growing mostly on wet, stony slopes.

Part used- Leaves.

Medicinal importance- used as laxative drug (enhances bowel movement and loosen stools)

04 Family name- Blechnaceae Ching ex Copeland 1940.

Genus- Woodwardia Smith 1793.

Species- *Woodwardia unigemmata* (Mak.) Nakai 1925.

Habitat- flourish on exposed or shaded forest areas.

Part used- Rhizome, Frond.

Medicinal importance- leaf extract possesses anti-oxidant property. (to shield cells from harm).

Family name- Dennstaedtiaceae Ching ex Sermolli 1940-1970

Genus- Pteridium Gleidtsch ex Scopoli 1760.

Species- *Pterium aquilinum* (L.) 1753.

Habitat- flourish in exposed regions.

Part used- Root.

Medicinal importance- having antiseptic property.

Anti-inflammatory properties that lessen intestinal mucosal membrane edema.

Family name- Gleicheniaceae (R.Br) C.Presl in 1825

Genus- Dicranopteris Bernhardii in 1805.

Species- *Dicranopteris linearis* (Burm.Fil.) Underw in 1907.

Habitat- flourish in exposed areas.

Part used-Fronde

Medicinal importance- Used to treat Asthma and also having Anti-microbial activity.

Family name- Lindsaeaceae Pichi-Sermolliin 1970.

Genus-Odontosoria (C.Presl) Fee in 1852.

Species- *Odontosoria chinensis* (L.) Smith in 1857.

Habitat-Flourish in moist places.

Part used-Fronde.

Medicinal importance-Used to treat Musculoskeletal pain and also having Diuretic property.

Family name- Lycopodiaceae P.Beauv. ex Mirb.,1802.

Genus-Lycopodium (L.), 1753.

Species-*Lycopodium japonicum* Thunberg , 1784.

Habitat- Grow mostly on grassy terrain, in woodlands, and on rocks.

Part used- Whole plant.

Medicinal importance-used to treat skin disorders and also having anti-inflammatory property (to reduce swelling).

Also used to cure joint pain.

Family name-Lygodiaceae Presl., 1845.

Genus-Lygodium Swartz, 1801.

Species-*Lygodium flexuosum* (L.) Swartz, 1800.

Habitat- flourishes in open spaces of forests.

Part used- Leaves and Root.

Medicinal importance -Rhizome paste is used on piles.

Used to heal wounds and treat ulcers.

Family name- Nephrolepidaceae Pichi Sermolli in 1975.

Genus-Nephrolepis Schott in 1834.

Species-*Nephrolepis cordifolia* (L.) C.Presl in 1836.

Habitat- Species that are discovered to grow in rocky places.

Part used-Leaves.

Medicinal importance-Used to stop excessive bleeding from wounds.

Family name- Ophioglossaceae (R.Bir.) Agardh in 1822.

Genus- Botrychium Swartz, Schrad in 1800.

Species-*Botrychium ternatum* (Thunb.) Sw. in 1801.

Habitat- Grow mostly in damp, arid environments.

Part used-Rhizome.

Medicinal importance- Used to treat Dysentery (Intestinal inflammation).

Genus-Ophioglossum (L.), 1753.

Species- *Ophioglossum reticulatum* (L.), 1753.

Habitat- Usually develops in areas that are damp and shaded.

Part used- Leaves.

Medicinal importance- Leaf juice having antispasmodic property ( to cure abdominal cramp)

Also used to cure diarrhea.

Family name- Osmundaceae Berchtold et presl 1820.

Genus-*Osmunda*(Linn.) 1753.

Species- *Osmunda regalis* (L.)1753

Habitat- flourish in wetlands, swamps, and marshes.

Part used-Leaves and Rhizome.

Medicinal importance- To cure or treat rheumatism, which is a condition where joints hurt and swell.

Used to induces abortion.

Family name- Polypodiaceae Berchtold et Presl, 1940.

Genus- *Pyrrosia* Mirb., 1803.

Species-*Pyrrosia lanceolata* (Wall.)Farw.1930

Habitat- Mostly grows in moist rocky areas and tree trunks.

Part used-Leaves.

Medicinal importance- Used to treat throat irritation and itching.

Family name- Pteridaceae Ching, 1982.

Genus-*Pteris* (L.) 1753.

Species-*Pteris wallichiana* Agardh, 1839.

Habitat- ferns that are commonly found flourish among forests.

Part used- frond (young and dried both).

Medicinal importance- Dermis-related ailments are treated with powdered dry leaves.

For flavoring, fronds are being used.

Family name- Selaginellaceae Willk, 1854.

Genus- Selaginella P. Beauv, 1805.

Species- *Selaginella bryopteris* (L.), 1753.

Habitat- Thrives mostly in tropical hill sides and is mostly found in shaded places.

Part used- Whole plant.

Medicinal importance- Plant paste is used to treat muscular weakness.

Also used for urine infection and dyspepsia or indigestion.

Family name- Pteridaceae Ching, 1982.

Genus- *Aleuritopteris* Fee in 1852.

Species- *Aleuritopteris bicolor* (Roxb.) Fraser-Jenk in 2009.

Habitat- mostly flourishes in well-drained soil and on rocks.

Part used- Frond and Root.

Medicinal importance-

Its frond and root are used to make a tonic to cure illnesses.

Also having antiseptic property (to prevent infection).

Family name- Thelypteridaceae Ching ex Sermolli in 1970.

Genus- *Thelypteris* Schmidel in 1763.

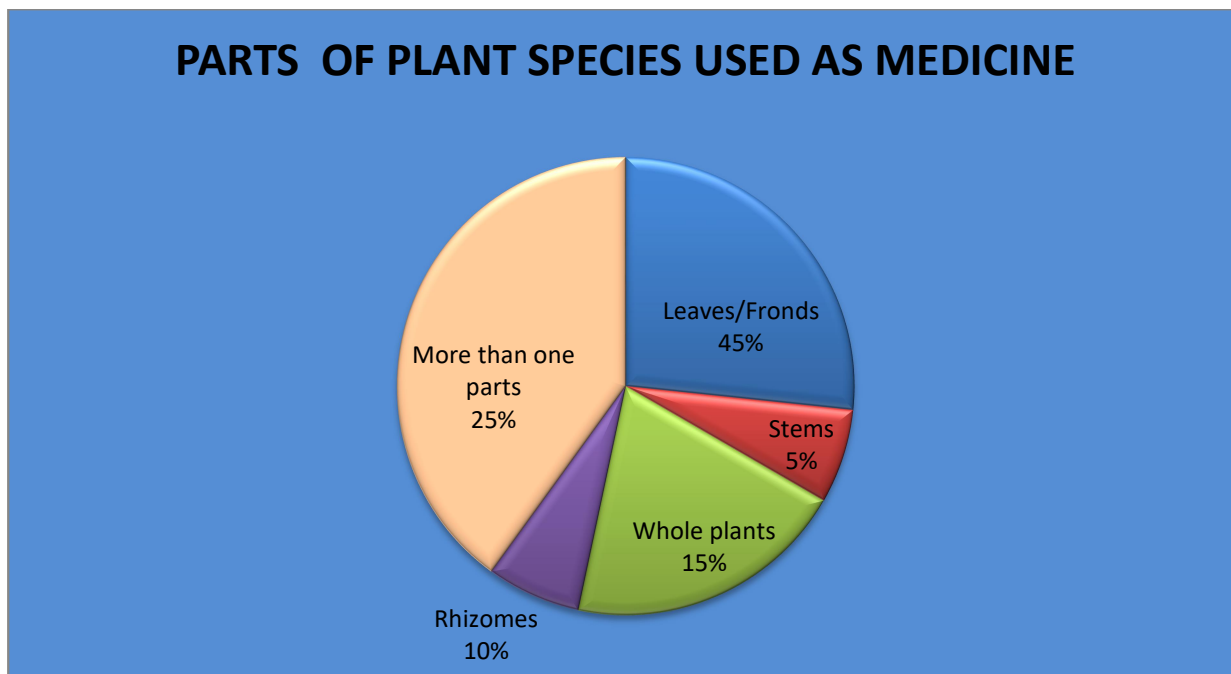
Species- *Thelypteris arida* (D. Don) Morton in 1959.

Habitat- mostly flourish in moist soil

Part used- Frond.

Medicinal importance- Wound healing.





## **RESULT & CONCLUSION**

The current study included 20 different species of pteridophyte belonging to 17 genera under 14 Families along with their ethno-medical applications. All the species are collected from Kumaon region of Western Himalaya. During Field observation it was found that the majority of medicinally important fern species are found in terrestrial habitats, followed by lithophytes and relatively few epiphytes. In addition, it was discovered that the majority of the gathered ferns leaves are utilized to prepare medical remedies. Stem and rhizomes are other portions that are utilized; in certain species, the entire plant is used medicinally. Data regarding the mode of administration of medicines prepared from these fern species were also collected. It has been found that the majority of the medicines are consumed orally in the form of juice or extract, some are also applied externally to treat conditions pertaining to the dermis or to promote wound healing due to their coagulant properties.

## **DISCUSSION**

This study suggests that the Kumaon region of Uttarakhand possesses an abundance of ethnomedicinal plants. Traditional understanding of the habitat, role, and application of species is required. It took a team effort to explore different parts of Kumaon in search of more valued medicinal plants. But for the sake of maintaining biodiversity, these plants should be used sustainably.

## **ACKNOWLEDGEMENT**

The author would like to express gratitude to all of the informants, particularly the local residents of the study area, who supported the field visit by offering crucial details about species of ferns that are significant for medicine as well as other relevant information like the part of the plant that is used and the proper way to administer the prepared medicine.

## **REFERENCES**

1. Chandra ,S. 2000. The Ferns of India (Enumeration, Synonyms and distributions). International Book Distributors Dehradun, India. Pp-459.
2. Dixit , R.D. Ferns are a much-neglected group of medicinal plants. I.J. Res. Ind. Med. 1975:10:74-90.
3. Dixit , R.D, Kumar Ramesh. Pteridophytes of Uttaranchal- A checklist . Bishen Singh Mahendra Pal Singh , Dehradun,2002.
4. Khullar SP. An Illustrated fern flora of the west Himalaya. Vol. I & II. Dehradun. 1994 and 2000.
5. Pande HC, Pande PC, An Illustrated fern flora of Kumaon Himalaya Vol. I & II, Bisen Singh Mahendra Pal Singh, Dehradun. 2002.
6. Pande HC, Pande Bhawana J. & Pande P C, Fern Allies of Uttarakhand (An Annotated Catalogue), Bisen Singh Mahendra Pal Singh, Dehradun. 2012.
7. Fraser Jenkins C R 2020 A modern taxonomic list of Indian Pteridophytes, Indian Fern Journal Vol. XXXVII (2020) pp 122-131.