



SARAKHS (*DRYOPTERIS FILIX-MAS*): MEDICINAL IMPORTANCE IN PERSPECTIVE OF UNANI MEDICINE AND PHARMACOLOGICAL STUDIES

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Review Paper

Received: 02.05.2024

Revised: 15.05.2024

Accepted: 31.05.2024

ABSTRACT

True natural remedies and medicinal plants can be used to treat and control various illnesses. The world is currently searching for natural substances with fewer medicinally potent negative effects. *Sarakhs* (*Dryopteris filix-mas*), a male fern, is the name given by botanists to this plant. The male fern is the hardest-working species that reproduces in our country. Rhizomes have been used medicinally. It possesses the *Mujaffif Qurūh*, *Qātil-i-Kirm-i-Shikam*, and *Kāsir-i-Riyāh* properties. Filicic acid, flavaspidic acid, filmaron and flavonoids are the chemical constituents. It has antioxidant, antibacterial, antifungal, and abortifacient properties.

No. of Pages: 6

No. of Figures: 1

References: 24

Keywords: Dryopteris filix-mas; Sarakhs; Rhizome; Unani Medicine.

INTRODUCTION

In Unani medicine, various rhizomes such as *Zanjabīl*, *Zard Chob*, *Zaranbād*, etc. etc. have been used since long time for various medicinal purposes.⁽¹⁾ *Sarakhs* is also a rhizome which is one of the most important drugs for treating intestinal worms and one of the key medications described in various classical literature. *Sarakhs* is known as *Batāras* in Greek⁽²⁾ and Male fern or *Aspidium* in English.⁽³⁾ *Sarakhs* (rhizome) is obtained from *Dryopteris filix-mas* belonging to family *Polypodiaceae*. The genus name is derived from Greek “*dryas*” means oak, and “*pteris*” means fern in reference to the

presence of some species of wood ferns in woodland areas populated with oaks.⁽⁴⁾ *Dryopteris filix-mas* is commonly used for medicinal purposes. It has two types male and female. The male type lacks flowers and fruits, but has only one stalk approximately one centimetre in length. Females lack stems and have only one leaf. It is found in hilly regions and in North America.⁽²⁾ When the stem was yellowish, it was crushed and oozed. The most potent constituent found in this plant is Filicic acid.⁽⁵⁾ It is an herbaceous perennial fern with a scaly creepy rhizome bearing stalked bipinnate leaves (fronds). The rhizome is composed of brownish-black, ovoid,

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cylindrical segments 3–4 cm in diameter and 6–15 cm in length. The folic acid present in rhizomes is a mixture of dimeric, trimeric, and tetrameric butanone chloroglucosides that kills tapeworms.⁽³⁾ Laminae narrowly deltoid in outline.⁽⁶⁾ Young fronds were coiled in a spiral and covered with brown scales. In summer two rows of green sori (round of sporangia) appear on the underside of fronds. They turn brown as they ripen and produce spores that the fern reproduces and spreads. All parts of the plant are poisonous.⁽⁷⁾ According to Antaki, its production is abundant in Syria, and its flower color is red. The seeds are black in color and are cultivated in Britain (Europe). North America, North Asia, and the hilly regions.⁽⁵⁾ *Dryopteris* is closely related to *Polystichium* and *Lastreopsis*, but distinguished from *Polystichium* by the kidney-shaped indusia, and from *Lastreopsis* by its abundance of stipe-scales and absence of hairs. *Dryopteris filix-mas* is closely related to *D. affinis* but can be distinguished by the second pinnae being round-ended and margins toothed throughout.⁽⁸⁾ *Dryopteris filix-mas*, a wild leafy vegetable, has gained popularity among high mountain residents in the Hindukush-Himalaya region due to its exceptional nutritional profile, and its commercial cultivation also offers viable income alternatives. Nevertheless, in addition to phytochemicals with medicinal applications, ecological factors strongly affect the mineral content and nutritional composition. However, little is known about how this wild fern grows in heterogeneous ecological habitats with varying soil physicochemical properties and coexisting species, producing fronds with optimal mineral and nutritional properties.⁽⁹⁾ the phytochemicals are oleoresin, folic acid, flavaspidic acid, filmaron and albaspidin, glycosides, anthracene derivatives, steroids/triterpenoids, tannins, flavonoids, and alkaloids.⁽¹⁰⁾

This study aimed to emphasize the therapeutic applications of *Dryopteris filix-mas*, drawing from descriptions in the literature and scientific studies conducted on different parts of this plant. The presence of these diverse phytoconstituents

underscores the potential of these plants for various medicinal purposes.

2. Materials and Methods

All accessible ancient textbooks were searched using key phrases, such as Sarakhs, *Qarfas*, and “*Batāras*” in the context of Unani medicine, in order to perform a thorough literature review. Additionally, terms like “male fern,” *Dryopteris filix-mas*, and so on were used to search internet databases like Google Scholar, ResearchGate, and others. Both traditional Unani terminology and botanical nomenclature were included in the search. The selection of review papers and experimental research for data collecting and analysis was done with great care. This methodical approach sought to compile pertinent data from modern scientific literature as well as traditional Unani sources, resulting in a thorough analysis of the therapeutic uses and characteristics of the *Dryopteris filix-mas* in the context of Unani medicine. Appropriate Unani Terminologies were taken from Standard Unani Medical Terminology Published by Central Council for Research in Unani Medicine in collaboration with the World Health Organization.

3. Observations

3.1 Geographical Distribution: This fern grows in various regions across Europe, temperate Asia, northern India, northern and southern Africa, temperate areas of the United States, and the Andes Mountains of South America.⁽¹¹⁾

3.2 Botanical description

A large herbaceous perennial fern with a scaly creeping rhizome bearing stalked bipinnate leaves (fronds). Young fronds were coiled in a spiral and covered with brown scales. In summer, two rows of green sori (a round group of sporangia) appear on the underside of the fronds. They turn brown as they ripen and produce spores that the fern reproduces and spreads. All the plant parts were toxic.⁽⁷⁾

3.3 Taxonomic Classification

Kingdom: Plantae
Division: Pteridophyta

Class: Pteridopsida
 Order: Polypodiales
 Family: Dryopteridaceae
 Genus: Dryopteris
 Species: *D. filix-mas*.

3.4 Description of the Unani literature

Sarakhs (rhizome) is black, knotty, and fibrous. Male ferns do not have stems, flowers, or roots. Only one branch of the yard originated from the root. Leaves were placed close to each other. The female plants had no branches and one leaf. However, some researchers say that female ferns have many branches and leaves. Its roots are very long and both species grow in hilly regions. Their efficacy is same and lasts for four years. When the root is broken, a dark color emerges. According to Antaki, its production is abundant in Syria, its flower color is red, the seeds are black in color, and it is cultivated in Britain (Europe). North America, North Asia, and the hilly regions. The effective component of this drug is a white powder, commonly known as Filicic acid. It has been described as hot in the second degree and dry in the first degree, but in others, it is written as hot and dry in the third degree. It acts as a deobstructive agent and dissolves rheum. Their consumption was beneficial for severe palpitation.⁽¹²⁾

3.5 Mutaradifat (Vernacular names)

The plant is known by various names according to different places and languages, as in.

Arabic:	Qarfas.
Bengali:	Pankhraj
English:	Male fern
Persian:	Kildārū
Roman:	Sagin.
Syrian:	Qatbus, Qatus.
Tamil:	Hirvi, Iruvi ⁽¹³⁾
Unani:	Bataras, Fasrafataras
Urdu:	Sarakhs

3.6 Ajza-i-Musta'mala (parts used)

Dried fronds, rhizomes, oleoresin⁽¹⁴⁾ of *Dryopteris filix-mas* are used for medicinal purposes.

3.7 Mizaj (Temperament):

Hār 2⁰ Yābis 1⁰ (hot and dry in 2nd and 1st degree respectively)⁽¹⁶⁾, Hār 1⁰ Yābis 2⁰ (hot and dry in 1st

and 2nd degree respectively)⁽¹⁵⁾, Hār Yabis 2⁰ (hot and dry in 2nd degree), Hār Yabis 3⁰ (hot and dry in 3rd degree).⁽¹⁶⁾

3.8 Miqdar Kharak (Dose):

The therapeutic dose is 7g⁽¹⁶⁾ and 1–3 g⁽¹³⁾

3.9 Af'al (Action)

It has *Mujaffif Qurah* (desiccative), *Qatil-i-Kirm-i-Shikam* (anti-helminthic) and *Kasir-i-Riyah* (carminative)⁽¹³⁾.

3.10 Iste'malat (therapeutic use)

Various therapeutic uses have been mentioned. It has been found effective in diseases like *Khafaqan* (palpitation), *'Irq al-Nasa* (sciatica), *Niqris* (gout), *Dadan-i-Am'a* (worm infestation).⁽⁵⁾

3.11 Tarkīb Iste'māl

(Method of Administration)

It repels lice and removes all stomach worms.⁽¹²⁾
 If sprinkled over boils, it becomes dry and fills.⁽¹²⁾
 If the wound is not healed by any means, it is healed by applying the paste of its rhizome to the wound.⁽¹²⁾

It is consumed in the quantity 10 ½ g up to 14 g to remove intestinal worms. It should be taken with milk as it seems to be less beneficial when it is taken alone.⁽¹²⁾

If *Sarakhs* is mixed with *Hinā* (Henna) and applied over scalp, it proves beneficial for initial stages of cataract.⁽¹²⁾ Its leaves should be kept over roof, it prevents development of flea over roof. If given with honey, it forbids pregnancy and aborts the child, acting as an abortifacient.⁽⁵⁾

3.12 Maḍarrat (toxicity, side effects, and adverse effects)

Though *Sarakhs* has many uses including *Mujaffif Quruh* (desiccative) but it has been found harmful for some vital organs. It is harmful to lungs and kidneys.⁽⁵⁾ As with herbal remedies or traditional medicines, moderation and caution are crucial to avoid potential adverse reactions or toxicity, and it is advisable to seek guidance from healthcare professionals or herbalists, especially when incorporating plants with potential

medicinal properties into one's diet or health care regimen.

3.13 Musleh (corrective)

It appears that in traditional practices, potential side effects such as kidney and lung-related issues related to *Dryopteris filix-mas* are addressed using specific remedies such as *Shah Balūt* (Oak) and *Katīra* (*Sterculia urens*) for kidneys.⁽⁵⁾ It is important to note that traditional remedies may vary and the effectiveness of specific herbs depends on individual factors. While these traditional remedies may have been used in certain cultural contexts, consulting healthcare professionals or herbalists is advisable for personalized advice and guidance, particularly if someone experiences adverse effects and toxicity from *Dryopteris filix-mas* or any other herb.

3.14 Badal (Substitutes)

Many other traditional substitutes are used instead of *Dryopteris filix-mas*. *Kamila* (*Mallotus philippensis*) is used as alternative.⁽⁵⁾ This substitute may serve similar purposes or possess medicinal properties comparable to those of traditional medicine. However, it is important to note that the efficacy and safety of substitutes may vary, and individuals should exercise caution and seek guidance from health care professionals or traditional practitioners when choosing alternatives.



Fig. 1: Plants of *Dryopteris filix-mas*.

3.15 Compound formulations:

Ma'jūn Sarakhs useful for intestinal worms.⁽¹⁷⁾

3.16 Chemical constituents:

Filicin, α -flavaspidic acid, albaspidin, filixic acid, from rhizomes; synthesis of filicinic acid; five acid identified in fronds-hexadeca-7,10,13-trienoic, octadeca 9,12,15-trienoic, eicosa-8,11,14-trienoic, eicosa-5,8,11,14-tetraenoic and eicosa-5,8,11,14,17-pentaenoic acids.⁽⁷⁾

3.17 Pharmacological Studies

3.17.1 Antibacterial activity

Among the five fern species, *D. filix mas* showed the most remarkable antimicrobial activity. *Lygodium altum*, *Salvinia molesta*, *Salvinia cuculata*, *Helminthostachys zeylanica*, *Dryopteris filix-mas* and its antimicrobial spectrum covers both gram positive and gram negative.⁽¹⁸⁾

3.17.2 Anti-oxidant activity

The methanolic extract of *Dryopteris filix-mas* leaves effectively reduced harmful DPPH radicals in a concentration-dependent manner that depended on the amount used. It can also reduce other substances, indicating that it can help neutralize harmful molecules. Additionally, this liquid has the potential to kill cells.⁽¹⁹⁾

3.17.3 Antifungal activity

Methanolic and flavonoidal extracts from *Marchantia polymorpha* L., *Dryopteris filix-mas* (L.) Schott and were tested against three fungal and plant pathogens; *Alternaria solani*, *Fusarium oxysporum* and *Rhizoctonia solani*. The extracts from *D. filix-mas* and *E. foliata* inhibited mycelial growth by over 80 %. *M. polymorpha* and *D. filix-mas* completely inhibited the mycelial growth of *R. solani* at the highest tested concentration (5 mg/ml)⁽²⁰⁾. The inhibition of spore germination of fungi was observed to be around 10% for most extracts at a concentration of 10 mg/ml.⁽²¹⁾

3.17.4 Contraceptive Activity

The plant extract inhibited spontaneous contractions and oxytocin-induced and high KCl-induced uterine contractions. The plant extract

had no effect on oxytocin-induced contractions under calcium-free conditions, indicating an inhibitory effect on uterine contractility. This may have possible applications as a tocolytic or contraceptive, as most contraceptive plants have shown a uterine-relaxing effect.⁽²²⁾

3.17.5 Insecticidal activity

In an in vitro study, the plant extract of *Dryopteris filix-mas*, *Tanacetum vulgare*, *juglans nigra*, *Syzygium aromaticum* and *Allium sativum* showed high Antischistosomal activity.⁽²⁰⁾

3.17.6 Anti-helminthic activities

It exhibits anti-helminthic activity. Most diseases caused by helminths are chronic and debilitating in nature; they probably cause greater morbidity and economic and social deprivation among humans. *Dryopteris filix-mas* has proven good against helminths.⁽²³⁾

3.17.7 Cytotoxic activity

Dryopteris filix-mas schott traditionally used for the treatment of various ailments. From the experiment it is clear that the methanol extract of leaves of *D. filix-mas* possesses strong antioxidant and cytotoxic activity so it may play an important role for the treatment of cancer. Cytotoxicity assays have been used to screen for cytotoxicity of this plant extract for therapeutic uses that targets rapidly dividing cancer cells.⁽¹⁹⁾

3.17.8 Toxic effects on heart

The toxic effects of male ferns were assessed in cats and rabbits through intravenous injections of filmaron or oral administration of fern extract. Lethal doses can lead to serious complications including arrhythmia, disturbances in ventricular function and myocardial infarction.⁽²⁴⁾

3.17.9 Anti-diarrhoeal activity

There is decrease in transit time in gastrointestinal tract due to consumption of this drug. Also, there is reduction in intestinal fluid volume. It has anti-diarrhoeal activity by reducing gastrointestinal peristalsis.⁽¹⁰⁾

4. Conclusion

This review highlights the therapeutic potential of *Dryopteris filix-mas*, commonly known as male

ferns, based on its traditional uses and scientific investigations. The plant exhibits a rich array of phytoconstituents, including filicic acid, flavaspidic acid, filmaron, and flavonoids, which contribute to its diverse medicinal properties, such as antioxidant, antibacterial, antifungal, and abortifacient effects. A detailed description of its morphology, particularly the characteristics of its roots, leaves, and reproductive structures, provides valuable insight into its botanical features. The traditional medicinal uses of *Dryopteris filix-mas*, as documented in historical texts, underscore its significance in various therapeutic applications, ranging from alleviating palpitations to treating stomach worms and promoting wound healing. However, caution is warranted regarding the potential adverse effects on the kidneys and lungs. Moreover, this review emphasizes the importance of combining *Dryopteris filix-mas* with other substances, such as milk or Hina, to enhance its therapeutic efficacy and mitigate potential side effects. Overall, this comprehensive exploration underscores the promising role of *Dryopteris filix-mas* in traditional Unani medicine and warrants further scientific investigation to unlock its full therapeutic potential while ensuring its safety and efficacy.

Consent and ethical approval

It is not applicable.

Acknowledgment

The authors extend their sincere gratitude to the Deputy Director of RRIUM, Srinagar, for providing all the necessary facilities essential for the completion of this research. Additionally, heartfelt appreciation is extended to the dedicated library staff of RRIUM, Srinagar, whose assistance in accessing and procuring relevant literature greatly enriched the content of this review. Their support and cooperation have been invaluable in the successful completion of this endeavours.

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