

Chapter-04

SWERTIA CHIRAITA: A COMPREHENSIVE REVIEW OF ITS ABUNDANT MEDICINAL PROPERTIES

Dr. MD Maseehullah*

*Assistant Professor, Department (Ilmul Advia),
Glocal Unani Medical College, Hospital & Research Center,
Glocal University, Mirzapur Pole, Saharanpur U.P.*

**Correspondence to: maseehullah@glocalunanicollege.in*

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ABSTRACT

Bisfaij is a well-known drug of Unani Medicine System. It is quite popular in conventional medical systems like Unani, Ayurveda, and Siddha. It's a fern with medicinal uses for its rhizomes. It belongs to the family Polypodiaceae. It is generally used in Unani medicine, for several pharmacological effects including Mulayyin (aperients), Mufatteh (deobstruent) and Munzij (alterative). Theophrastus and Dioscorides both have mentioned its purgative properties. They considered that it acts as an expeller of all kinds of pecant humors; thus it is used for the treatment Sawdawi Amraz, Juzam (leprosy), Malankhuliya (Melancholia) and Amraz-i-Mafasil (joints diseases), and is included in many pharmacopoeial and non-pharmacopoeial preparations.. Bisfaij (Polypodium vulgare) comprises of essential oil, fatty oil, resin, glycoside and saponin. It is also a good source of Tetra and Penta-cyclic triterpenoids. Numerous researchers have conducted in-depth investigations on Bisfaij, exploring a broad range of its pharmacological activities. which includes anti-inflammatory, antimicrobial, and antioxidant, Analgesic, Anti pyretic and CNS depressant activity properties. This review aims to give a thorough overview of the literature and scientific studies on the pharmacognostic properties, chemical makeup, and pharmacological actions of this plant.

Keywords: *Bisfaij, Unani drug, Sawdawi Amraz, Tetra and Penta-cyclic triterpenoids*

1. INTRODUCTION

Bisfaij is a very popular Unani medicinal plant which has been extensively used in all the traditional medicines to treat several ailments such as joints diseases, sawdawi amraz, leprosy, Melancholia and is reported to have an extensive spectrum of pharmacological activities.

*It is recognized by an array of vernaculars such as Azras al-Kalb, Saquib al-Hajr, Kasir al-Arjil. Tashmeez, Barzia in Arabic, Pholodin. Qulophodiune in Greek, Common Polypody, Sweet Fom in **English**, **Khankali**, Khankli, Kala Bichwa, Bisfaij in Hindi and Tashtiwan, Bispaik, Sakarmal in Persian (Dymock, 1893; Ghani, 2011; Ibn Baitar, 2000; Khan, 2012; Khory and Katrak, 2008). The plant is found in Europe and Persia; it grows on rocks and moist places. It is found in America and Turkey too. In India it is procured from other countries. The progress of plant is more during the months of October and November (Dymock, 1893; Khory and Katrak, 2008). Theophrastus and Dioscorides both have mentioned its purgative properties. They considered that it acts as an expeller of all kinds of pecant humors.*

2. MORPHOLOGY

Polypodium vulgare is generally identified as Common Polypody. It is leaf losing (deciduous) and hardy evergreen fern that is found in many parts of the world. It's an epiphyte that grows attached to branches of forest trees and sometimes upon rocks or dry ground. This rhizome is fibrous, dark brown or grass green coloured, having hard and heavy surface, rugous, longitudinally fissures, more compressed on one side than on the other. The upper surface has several horn-like tubercles or scaly projections or suckers which are about ½ inch long and fissured. The taste is acrid or sweetish with disagreeable aroma. Leaves are about 10-25 cm long, single, leathery, green colored, erect or spreading with blade elongated, tapering or pointed tip, deeply cut almost to the central axis, leaflets almost alternate, hairy, margin entire or shallowly toothed, blunt tipped; central axis basically winged, leafstalk lightly scaled near the base. The petioles are shorter than the blade jointed and ultimately abscising at the point of attachment to the rhizome leaves simple conspicuously, pinnately lobed. The venations of the lamina are reticulated or open (Dymock, 1893; Khory and Katrak, 2008).

3. UNANI DESCRIPTION (*Mahiyat*)

The plant measures about 9 inches and bears tiny leaves on just one branch. Its feature is that it is a climber without any fruit or flowers. and spreads on the branches and trunk of baloot (*Quercus rubra*) tree. The root which serves as drug is fibrous in character and has dark brown to grassy green colour. The fresh root, which is grassy green in colour, becomes dark on becoming old. The surface is hard hairy, rugous and longitudinally fissured. The surface presents several horns like tubercles or scaly projections of suckers. Each projection is 0.5 inch long and fissured. Due to these projections Bisfaij is named as *Kasir al-Arjil* i.e. resembling the legs of centipede. Each piece is flattened and more compressed in one side than other. The aroma is disagreeable somewhat resembling to that of Opium. Taste is acrid or sweetish in nature. The drug varies in quality. The root is thick, short like little finger, tasting like cloves and fresh is said to be of best quality. Fracture is pistachio colored from inside. The root which has not such properties is not able to use (Ghani, 2011, Ibn Baitar, 2000; Khan, 2012)

i. Parts used (*Hasas Mustamila*)

Rhizome of the plant is utilized (Ghani, 2011; Ibn Baitar, 2000; Khory and Kartak, 2008; Nadkarni, 2001).

ii. Temperament (Mizaj)

- Hot (2°) and Dry (3°) (Ghani, 2011; Ibn Sina, 2010; Khan, 2012)
- Hot (3°) and Dry (2°) (Ibn Baitar, 2000)
- Hot (2°) and Dry (1°) (Ghani, 2011, Khan, 2012)

4. PHYTOCHEMICALS

Bisfajj (*Polypodium vulgare*) comprises of essential oils, fatty oils, resin, glycoside and saponin. It's also a rich source of Tetra and Penta-cyclic triterpenoids.

Root or rhizome yields essential oil containing butyric, hexanoic, lauric and succinic acids, methyl-salicylate, butyric valeric and butyric esters, fatty oil acting as energetic purgative, another resin containing phenol and its ester which is strongly anti-helminthic, a glycoside, sanambian and saponins (Chopra, 2006). Polypodine A (ecdysterone), Polypodine B (5B - hydroxyl eedysterone), Gluco-caffic acid, Polydine, Osladine, Samanbaine are the saponins present in it (Rastogi et al; 1990).

It also contains pollinastanol, cycloartanol, cyclolaudenol, 31 - noreycloartanol 7-dehydrocholes tenol, lophenol, 24 methylene lophenol, citro standienol fucosterol and B sitisterol, (+) catechol -7- arabinoside (Rastogi et al: 1991)

The Catechin -7-O-D apioside along with kaempferol - 3-0 - (4 or 5 -rhamnosyl) arabinoside, rutin hyperin, schafloside, isoschafto side, kaempferol - 3- 0 - glucoside and arabinoside - 7-0 - rhamnoside are also present in *Polypodium vulgare* (Rastogi et al: 1993).

Table-1: Pharmacological actions (Afaal)

Mujaffif (Desiccant)	Khan, 2012
Muqawwi-i-Qalb (Cardiotonic)	Ghani, 2011; Khan, 2012
Mufarrih-i-Qalb (Exhilarant)	Ghani, 2011; Khan, 2012
Mushil-i-Sawda (Melanogogue)	Baghdadi, 2005; Dymock, 1893; Ghani, 2011; Ibn Sina, 2010; Khan, 2012
Mushil-i-Balgham (Phlegagogogue)	Baghdadi, 2005; Dymock, 1893; Ghani, 2011; Khan, 2012
Mushil-i-Safra (Cholagogue)	Baghdadi, 2005; Dymock, 1893; Ghani, 2011; Khan, 2012
Munzij (Alterative)	Dymock, 1893; Khory and Kartak, 2008

Mufatteh (Deobstruent)	Dymock, 1893; Khory and Kartak, 2008
Muliyyin (Aperient)	Dymock, 1893; Khory and Kartak, 2008

Table-2: Therapeutic uses (Mahal-e-istemalat)

Sawdawi Amraz	Ghani, 20101; Khan, 2012
Juzam (Leprosy)	Ghani, 2011; Khan, 2012
Amraz-i-Mafasil (Arthritis)	Ghani, 2011; Khan, 2012; Khory and Kartak, 2008
Malankhuliya (Melancholia)	Ghani, 2011; Khan, 2012
Sara (Epilepsy)	Ghani, 2011; Khan, 2012
Qulanj (Colic)	Baghdadi, 2005; Ghani, 2011; Khan, 2012
Nafkh-i-Shikam (Flatulence)	Baghdadi, 2005; Ghani, 2011; Khan, 2012;
Zof-i-Basar (Amaurosis)	Dymock, 1893

i. Dose (Miqdar-e-khuraq)

- 4.5-10.5 g. (Ghani, 2011; Khan, 2012)
- 7-17 g. (In the usage of decoction) (Ibn Baitar, 2000)
- 7- 21 g. (In the usage of decoction) (Ghani, 2011; Khan, 2012)

ii. Adverse effect (Mazarrat)

Gastric toxicity, pulmonary toxicity, renal toxicity, Carcinogenic (Ghani, 2011; Khan, 2012).

iii. Correctives t (Musleha)

Halela-e- zard (*Terminalia chebula*); Gul-e-surkh (*Rosa damascena*), Parsiyaoshan (*Adiantum venustum*), Zinjabil (*Zingiber officinalis*), Badyan (*Foeniculum Vulgare*) (Ghani, 2011, Ibn Baitar, 2000; Khan, 2012).

iv. Substitute (Badal)

Aftmoon (*Cuscuta reflexa*) half dose of Bisfajj and Namak Hindi (Indian salt) one fourth dose of Bisfajj (Ghani, 2011, Ibn Baitar, 2000; Ibn Sina, 2010; Khan, 2012).

5. PHARMACOLOGICAL STUDIES

i. Anti-oxidant and Anti-microbial Studies

Wafa and Sofiane (2017) studied the antioxidant (by DPPH) and antimicrobial effects of methanolic extracts of *Polypodium vulgare* against fungi (*Aspergillus*

niger, *Aspergillus flavus* and *Candida albicans* ATCC1024), Gram-positive bacteria (*Staphylococcus aureus*) and Gram-negative bacteria (*Escherichia coli* and *Salmonella typhimurium*). The results indicated very important antioxidant capacities along with a low antibacterial activity but reflected an antifungal power against *Aspergillus flavus*.

ii. Smooth Muscle Relaxant

Naz *et al.* (2016) evaluated the consequence of polypodium rhizome extract on the contraction of smooth muscle by the use of *in vivo* and *in vitro* experimental methods. The study revealed anti-spasmodic effect in jejunum, trachea and the urinary bladder of rabbit which were isolated (The extract undid the contractions induced by high K⁺ (80 mM) and carbachol (1 µM). A notable protective effect against castor oil-induced diarrhoea in mice was observed, which was dose-dependent.

iii. Analgesic, Anti pyretic and CNS depressant activity

Mannan *et al.* (1989) evaluated the aqueous extract of *Polypodium vulgare* roots and found that the drug decreased the spontaneous motor activity in rats and prolonged the pentobarbitone induced hypnosis.

The extracts reduced the body temperature as seen by gradual fall in rectal temperature of rats. Furthermore, its administration in the same dose significantly prevented or reduced the pyrexial response of TAB injection in rabbits showing anti pyretic effects.

It increased the reaction time to pain stimuli in rats, post administration of the extract thus demonstrating the analgesic activity of the medicine.

6. CONCLUSION

Bisfaij had been a very popular drug among Unani medicines and still, it offers many promising prospects for both traditional and modern medicine. It is a potential drug for diverse ailments. This review paper summarized the identifying features based on its pharmacognostical features, ethnobotanical uses, phytochemistry, various pharmacological activities, and Unani literature survey. More efforts are required to investigate the mode of action of this plant in various types of diseases. Further, more clinical studies should be conducted on larger samples to establish the efficacy of using *Bisfaij* in medicine.

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