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## **Bisfayej (*Polypodium vulgare* L.): A review on medicinal importance of rhizome with Unani prospective and modern pharmacology**

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### **Abstract**

About 80 percent of the world population is using herbs for medicinal purposes. The whole plant and some time the particular parts of the plants are used because of the specific quality of that parts. Different parts of plants like roots, seeds, fruits, flower and their storage organs like bulb, corm, tuber, rhizome, tuberous root and pseudo bulbs etc. are used for medicinal purposes and it is believed that, it is safer and effective in crude form than isolated phytochemicals. Rhizomes of several plants are used in Unani medicine under the name of "root", including *Bisfayej*, *Khulanjan*, *Vaj Turki*, *Zanjabeel*, *Zarambad* etc. In this communication information about *Bisfayej (Polypodium vulgare L.)*, a versatile medicinal rhizome is described in detail. Its includes introduction, distribution, botanical description, temperament, pharmacological action, therapeutic uses, toxicity and adverse effect, correctives, substitutes, compound formulations, chemical constituents and other scientific researches.

**Keywords:** Bisfayej, Rhizome, Unani Medicine, *Polypodium vulgare* L., Fern

### **Introduction**

*Bisfayej* consist of dried rhizome of *Polypodium vulgare* L. of family Polypodiaceae. In Unani system of medicine, it is used since the time of ancient Greeco Arab physicians like Theophrastus, Dioscorides, Galen (131-210 A.D), Zakaria Razi (850-925 A.D), Ibn-e-Sina (980-1037A.D) and Ishaq bin Imran [Ibn-e-Sina, YNM]. The drug is used with different names e.g. *Azras-ul-Kalb*, *saqib-ul-hajr*, *basbaij*, *sakeeraghli* in Arabic; Common polypody, oak fern, wall fern in English; *Khangali*, *khankali* in Hindi; *Basp paya*, *bispayek*, *tashtiwani*, *baspaik* in Persian; *Bisfayej*, *Bolikhudiyun* in Unani and *Bisfayej* in Urdu [1,2,3]. *Polypodium vulgare*, the name is derived from poly (many), pous, podos (a foot) and vulgare (common); same the Persian name also derived from *Bist* (twenty) and *Paya* (foot), which indicates multiple legs or foot like an arthropod which has numerous leg called *Arba Arbain-Milipede*, as the rhizome has multiple of shoots, so due to resemblance it is named as *Bist paya*, *Basp paya*, *Baspayek* and *Bisfayej*. Its Hindi name *Khangaali* also indicates its multiple legs. The Arabic name of *Bisfayej* is '*Azras-ul-Kalb*' which means dog's tooth, in illusion to the toothed appearance of the leaves, *kasir-ul-Arjal* "many-footed," and *Saqib-ul-Hajar* "penetrating stones" [2, 3, 4, 5]. The fern is spreads on the branches and trunk of Oak tree in a climbing nature. It has only one branch with small leaves. The Rhizome which is used as drug is fibrous, knotty mud coloured with black or red tinged. The surface of the root is hard, hairy, rugous and longitudinally fissured. The upper surface presents several hairs like tubercles or scaly projections, each projection is curved, 0.5 inch long and fissured. The taste of rhizome is sweetish, nauseous acrid and astringent [1, 4, 6].

**Distribution:** It is herbaceous perennial fern found throughout the year. It is a native to Europe, also found in Turkey and America. In India, it is imported from other countries [1, 6].

**Botanical Description:** It is an herbaceous, perennial fern growing to a height of 30cm with underground stem called rhizome. The rhizomes are creeping, irregular, with colour of yellowish brown externally and green internally, with membranous scales extending to the caudex or base of the stipe. Leaves and petioles are above the ground, various crested, deeply pinnatifid, dissected and plumed in the numerous cultivars. Its upper surface is adhered with tubercles [6].

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**Scientific Classification:** Kingdom: Plantae; Division: Pteridophyta; Class: Pteridopsida; Order: Polypodiales; Family: Polypodiaceae; Genus: Polypodium; Species: *vulgare*.

**Temperament (Mizaj):** Hot in II<sup>nd</sup> degree and Dry in III<sup>rd</sup> degree [3].

**Therapeutic action and uses (Afaal wa Khawas):** The rhizome is commonly used for its *Mushile sauda* (purgative of black bile), *Mushile balgham* (purgative of phlegm), *Muqawwie qalb* (cardiotonic), *Mufarreh qalb* (exhilarant), *Kasire riyah* (carminative), *Muhallile Nafakh wa reyaah* (antiflatulent) properties. Ibn-e-Sina told that it removes excess of black bile from heart and performs good *Muqawwi* and *Mufarreh Qalb* properties and also removes morbid matters from brain and whole body [1, 2, 3, 7, 8].

It is used to treat *Bawaseer anf* (bleeding polyp of nose), *Amraze Qalb* (cardiac diseases), *Qoolanj* (colitis), *Wajaul-mafasil* (arthritis), *Ituwae Asaab* (tortuosity of nerve). It is also effective in *Amraze saudavia wa balghamia* like, *Sara* (epilepsy), *Malinkholia* (melancholia), *Suaal* (cough), *Zeeq-un-nafs* (asthma), *Bawasir* (haemorrhoids), *Warne tajaweeful Anf* (sinusitis), *Juzam* (leprosy) and cracks in between the fingers etc. [2, 3, 8, 9].

**Toxic or adverse effect (Mazarrat):** Harmful for lungs and kidney, also produces nausea [9, 10].

**Correctives (Musleh):** Gule surkh-*Rosa damascena* Mill. and Halela zard- *Terminalia chebula* Retz. are used as corrective to avoid its toxicity and adverse effect [2].

**Alternative or substitute (Badal):** Some time in absence or unavailability of drug *Aftimoon-Cuscuta reflexa* and *Ayarij fiqra-Aloe barbadensis* can be used as substitute [2, 11].

**Dose (Miqdar Khurak):** Rhizomes are used in crude form in a dose of 6-15gm.

**Compound Formulations (Marakkabat):** Different compound formulations in Unani Medicine having Bisfayej are as follows:

Arq-e-Juzam; Itrifal Aftimoon, Itrifal Aftimoon Mushil, Itrifal Ghudadi, Itrifal Hamaan, Itrifal Kishniz, Itrifal Mushil, Itrifal Sanai, Itrifal Ustokhuddus; Jawarish Qurtum, Jawarish Shareyaran; Majun chobchini, Majun Seer Alvikhan, Majun Ushbah, Majun Najah, Safoof Chobchini, Safoof Lajward [1, 12].

**Major Chemical Constituents and other Scientific Researches:** The rhizome gave saponin glycosides, based on polypodosapogenin, including osladin; ecdysteroids; phloroglucin derivatives; It has organic substances as resins, tannins, steroid, flavonoids, alkaloids, glycosides, protein, reducing sugar; the inorganic substances as calcium, magnesium, potassium, iron, sulphur and chloride; Essential oil found in roots and rhizomes contains lauric acid, butyric acid, succinic acids, and hexoic acid with methyl salicylate, isovaleric and  $\alpha$ -methyl butyric esters; A new cycloartane triterpenoid-cyclopodmenyl acetate is isolated from the rhizomes and characterized as 24, 24, 27-trimethyl-9, 19-cyclolanost-25-en-3 $\beta$ -yl acetate [13, 14]. Bisfayej (*Polypodium vulgare* Linn.) has been found to have

protective effect in drug induced catalepsy, thus suggesting that it (*Polypodium vulgare* Linn.) enhances the transmission of dopamine in CNS and can be explored for disorders like Parkinsonism The rhizome extract was found to possess CNS depressant and anti-epileptic activity [4]. The insecticide and miticide effect of ecdysones present in the rhizome were reported topically on a wide variety of Arthropods [15]. Extract of *P. vulgare* showed antiviral activity against vesicular stomatitis virus in monkey cell culture. The phenolic compounds present in rhizome have antioxidant property and also have a protective chemical barrier against environmental stresses.

## Conclusion

Bisfayej is an important medicinal rhizome obtained from the fern *Polypodium vulgare* L. of family Polypodiaceae, which is claimed for the treatment of various ailments by the Physicians of Unani System of Medicine. From the above review work it can be clearly concluded that the new researches also validated the use of rhizome in *amraze dimagh wa asab* (Cerebral and Nervine disorders) and other diseases as mentioned in Unani Classical literature.

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