REVIEW ON BEEKHE ANJBAR (ROOT OF Polygonum bistorta L.) WITH UNANI PERSPECTIVE AND MODERN PHARMACOLOGY

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ABSTRACT

Polygonum bistorta Linn is an incredible herb belongs to family polygonacae which comprises of 300 species spreading world widely, among these P. bistorta L is most imperative. It is commonly known as adder wort, snake root, bistort or dragon wort. Description of P. bistorta L present in Unani literature as anjbar which is well known for its haemostatic property and being used to control bleeding from any part of the body. Unani physicians were using beekhe anjbar as medicine which is the rhizome of P. bistorta L. Anjbar is cold and dry in temperament so it is astringent, although all parts of this plants are astringent but root of Anjbar is used as medicine to check bleeding. This article comprises the pharmacological properties of P. bistorta L with modern and Unani perspective.

KEYWORDS: Polygonum bistorta Linn, anjbar, Unani, rhizome, pharmacology.

INTRODUCTION

The plant kingdom is the foremost source of novel natural products with potential to be used as drugs or pharmaceutical mediators. According to The World Health Organization, more than 80% of the world population in developing countries depends primarily on plants based medicines for basic healthcare needs. Polygonum bistorta Linn is a member of Polygonaceae family having 300 species which are distributed worldwide in temperate climates. The rhizomes of P. bistorta L. have been used in Traditional Chinese Medicine to treat dysentery.
with bloody stools, diarrhoea in acute gastroenteritis, acute respiratory infection with cough carbuncles, scrofula, aphthous ulcer, haematemesis, epistaxis, haemorrhoidal bleeding and venomous snake bite. In Unani system of medicine *P. bistorta* L. is known as *Anjbar* which is a roman word and its root *beekhe anjbar* is used widely as haemostatic drug. *Anjbar* is the root of an herb which is about as thick as finger and having few fibres outside of it. Height of this plant is 2 feet its branches are reddish and fruits are also red. After shedding of flowers small fruits with sheath appear which are filled with small seeds. Root found in depths which is rough and reddish black in colour. Root is used as medicine. *Anjbar* is mostly much valuable and its root is an enormous drug, all parts of *Anjbar* are astringent and viscous, *shami anjbar* and *tabristani Anjbar* are considered finest in quality. Temperament of *Anjbar* is cold and dry in first degree according to some physicians it is cold and dry in third degree but according to Jalinoos *anjbar* is hot and dry in temperament. Due to its cold and dry temperament *Anjbar* is haemostatic and helpful in controlling bleeding from any part of the body which is its key action. Bistort roots principal constituents are tannic acid, of which it contains a large quantity, some gallic acid, and much starch. Its virtues are extracted by water, and its decoction becomes inky-black on the addition of persalt of iron, and with gelatin it forms a precipitate. The astringent properties of the rootstock are due to the presence of the tannin compounds. The tannin contents undergoes variation during the vegetative period of the plant, the maximum being at the time of fruit bearing. The tannin is also present in the leaves to the extent of 5-10 percent.

**Taxonomic classification**

**Kingdom-** Plantae; **order-** Caryophyllales; **Family-** Polygonaceae; **Genus-** Polygonum; **Species-** bistorta.

**Botanical name-** Polygonum bistorta L.

**Pharmacopoeia name-** bistortae rhizoma

**Synonyms-** *P. viviparum,* *P. paleaceum,* *polygonum aviculare L.*

**Vernaculars**

**Sanskrit-** Miromati, nisomali. **English-** Knot grass, bistort, adderwort, dragonwort, snake root, snake-weed **Punjabi and hindi-** Kuwar, bijband, ban-natia. **Kashmiri-** Drop
**Morphological description**

An herbaceous perennial herb up to 60 cm high with a thick twisted root-stock.[7] cylindrical, woody, about as thick as a finger, widely creeping, much branched, ridged with leaf-scars on the outside, brownish, pale red within, giving off numerous fibrous roots, usually twisted into an s-shape, branches ending in tubers. Stem erect quite simple, 1 ½ - 2 feet. High, cylindrical, smooth, striate, slightly thickened at the nodes. Radical leaves large, on long stalks, ovate, acute, abruptly constricted at the base and then attenuated into the petiole, margin entire, somewhat undulated. Flowers arranged in pairs, each couple surrounded at the base by two scarious cuspidate bracts, stalked, articulated to the summit of the smooth slender pedicles and readily separating from them, clusters very densely crowded on the upper part of the stem, where they form a solid, cylindrical, oblong, blunt, erect inflorescence, 1-2 inches long. Fruit a small, indehiscent, triqueterous, dark-brown, shining, pointed nut, seed completely filling the fruit.[6]

**General description of bistort rhizome**

Bistort root or bistort rhizome derives its name from being commonly twice folded or twisted on itself and hence this character is one of its marked peculiarities. It has a hard firm texture, a deep reddish brown colour externally, and a reddish or flesh colour internally, it is without odour, but with a strong, pure, astringent taste. [6] The herb is used in stews and soups. It is recommended for use in silage. The root stock are reported to be eaten. The herb is wide spread in its distribution and its curled rhizome has been used under the name of snake root in medicine. It is the anjubar of western arabs. The root stocks are somewhat flattened, hard with annual thickening and traces of rootlets.[7]

**Habitat**

*Polygonum bistorta* L. is one of the most important herbs in the genus of polygonum which is comprised of 300 species. This herb distributes worldwide they could be find in north temperate regions such as Europe and north America where the herb is commonly known as adderwort, bistorta, or knotweed. In china it is called Quanshen and is especially abundant in the southwest region, over 120 species have already been identified and more than 80 species have reported medicinal uses.[2] This is a well known plant though scarcely common in moist or swampy meadows and on the borders of damp woods, throughout great Britain, when once
established it is with great difficulty eradicated, the leaves frequently forming large patches year after year without any flowering stems being sent up. The bistort has a wide range throughout the northern hemisphere, reaching from the arctic regions of Europe, Asia and America to south Europe, the Himalaya and Canada. [6] Bistort is native to Europe, Asia and North America and in India it is distributed in the Himalayas from Kashmir to Sikkim and in the hills of Assam at the altitudes of 2,700–4,500 m. [7,10]

**Characteristic feature of bistortae rhizoma**

**Shape**- compressed-cylindrical, usually curved, into a shrimp-like shape both ends obtuse or slightly narrowed.

**Size**- 2-11 cm long, 8-25 mm in diameter.

**External colour**- externally purple brown to dark brown.

**Surface**- rough, one side protuberant and the other side flat or slight furrowed, with thick annulated striations and remnants of rootlets or root scars.

**Texture**- hard, fracture roundish or nearly reniform, pale brown to brown, dotted vascular bundles yellowish-white, arranged interruptedly in a ring.

**Odour and taste**- odour slight and taste bitter and astringent. [2]

**Part used**

Bistort root [3,11]

**Mizaj**

Cold (1⁰) and dry (1⁰) [3,4,5,11]

Cold (2⁰) and dry (2⁰) [12]

Cold (3⁰) and dry (3⁰) [4,5]

**Actions and uses in Unani system of medicine**

Astringent and haemostatic (*habis wa qabiz*), strengthens the stomach and intestine (*muqawwi meda wa ama’a*), useful in bloody dysentery and diarrhoea(*da’fe zaheer wa ishal*), *mussakkine safra wa joshie khoon*. [3,12]
Haemostatic property

Its haemostatic action is useful in haemorrhage from all over the body,\textsuperscript{[4,5,13,14]} esp. chest, lungs,\textsuperscript{[4]} bleeding piles,\textsuperscript{[4,5]} trachea, pleura, intestinal abrasion and liver.\textsuperscript{[4,5,13,14]} It is used to stop haemorrhage of all organs of body e.g. epistaxis, haemoptysis, menorrhagia, diarrhoea and hematemesis.\textsuperscript{[11]}

GIT

\textit{Anjbar} is gastrotonic and useful in stomach diseases. Strengthens the stomach and intestine. Due to its \textit{musakkine safra} action it prevents nausea and vomiting.\textsuperscript{[5,13,14]} Due to its astringency it is beneficial in diarrhoea either bloody or not, it stops diarrhoea but does not produce constipation.\textsuperscript{[4,5,13,14]} \textit{Gilani} has written in \textit{Sharah of Mufradate Qanoon} that \textit{Anjbar} is useful in intestinal abrasion and ulcers and stops bleeding through intestine.\textsuperscript{[5]} It is beneficial in anorexia. \textit{Sharbate anjbar} with \textit{qurse kuharba} is useful in intestinal abrasion.\textsuperscript{[4]}

Local application

Its local application in the form of paste is useful in sprain, dislocation, fracture of bones and also useful in muscle injury.\textsuperscript{[5]} Powder of dried leaves of \textit{anjbar} when sprinkled over wound either acute or chronic it stops bleeding and helps in healing of the wound.\textsuperscript{[4,5,13,14]}

Action on TB

In case of tuberculosis when patient become cachexic and there is anorexia with weight loss in that condition \textit{anjbar} is very beneficial.\textsuperscript{[4,5]}

Piles

If \textit{anjbar} in qty. of 3 ½ gm to 4 ½ gm boiled in water and used with sugar or other drugs is useful in bleeding piles and inflammation of anus.\textsuperscript{[5]}

Antidote

It act as antidote.

Respiratory system

It prevents nazla.\textsuperscript{[4]}

\textit{Miqdare khoorak}(dosage)

4 ½ gm\textsuperscript{5}, 4gm,\textsuperscript{4} 5-7gm\textsuperscript{3}, 3-5gm.\textsuperscript{[12,13]}
Faile khas (main action): Da’fe zaheer damwi wa ishal.\textsuperscript{[8,60]} haemostatic for all organs of body.\textsuperscript{[4,5,12,13,14]}

Muzir: For cold temperaments\textsuperscript{[3,4,5,12,13]} and for bladder\textsuperscript{[4,5]}

Musleh: Sugar\textsuperscript{[4,5]} pure honey,\textsuperscript{[3,13]} zanjabeel\textsuperscript{5,12,13}

Mazah: Tasteless\textsuperscript{[3,14]}

Badal: Zarishk, bartang of same quantity or 1/4\textsuperscript{th} of gile armanti,\textsuperscript{[4,5]} habbul aas.\textsuperscript{[12,13]}

Murakkabat: Sharbate anjabar, safoofe istehaza, majoone tewaj.\textsuperscript{[3,11]}

Action and uses in modern medicine
Expectorant, diuretic,\textsuperscript{[9]} tonic, astringent, antiseptic, and antiperiodic.\textsuperscript{[8]} Febrifuge, haemostatic \textsuperscript{[9]} Anti inflammatory, astringent, demulcent, anticatarrhal, antidiarrhoeal,\textsuperscript{[15]} Usefull in diarrhoea, enteritis, bleeding haemorrhoids, skin inflammation, stomatitis, gingivitis.\textsuperscript{[9]} used for internal haemorrhages, irritable bowel, diverticulosis, urinary and uterine affections. Used as a mouth wash and gargle for ulcerated mouth and bleeding gums.\textsuperscript{[15]} Mixed with gentian it is given as a decoction of the root( 1 in 10) in 1 to 2 ounces doses in malaria,( intermittent fever)\textsuperscript{[6]} chronic diarrhoea and lithiasis, also used in capillary bronchitis whooping cough and other lung affections. Decoction is used in gleet and leucorrhoea as an injection and as an excellent gargle in relaxed sore throat and spongy gums and as an excellent lotion for ulcers.\textsuperscript{[6,8,16]} Applied to abscesses.\textsuperscript{[16]} It has been used in Chinese folk medicine to treat dysentery with bloody stools, diarrhoea in acute gastroenteritis, acute respiratory infection with cough, carbuncles, scrofula, aphthous ulcer, hematemesis, epistaxis, hemorrhoidal bleeding and venomous snake bite.\textsuperscript{[17,18,19,20]} Liquid extract of the root stocks, and their decoction are used as astringent in diarrhoea, profuse menses, colitis and gingivitis. The preparations of this herb are substituted for Peruvian rhatany( krameria triandra)\textsuperscript{[7]}

Chemical constituent
Polygonic acid, tannic acid, gallic acid, starch, calcium oxalate and essential oil\textsuperscript{8} The astringent properties of the root stock are due to the presence of tannin compounds (15-22%, up to 36%). The tannin is of mixed type; catechol, phloroglucinol, gallic acid and phlobaphene have been identified. Methyl anthraquinone, calcium oxalate (1.1%), starch
(30%), albumin (10%), and traces of emodin are also reported in the root stock. It is rich in ascorbic acid; flowers contain 746.6, leaves contain 722.3 and rootstock contains 132.2 mg/100 gm.[7]

The herb contains ferulic, sinapic, vannilic, syringic, melilotic, p-coumaric, p-hydroxybenzoic, gentisic, salicylic and ellagic acid, about 15-20% tannins mainly catechins.[15]

**Advance researches**

**Hepatoprotective, antioxidant and anticancer activity**

Aqueous extract of the roots of *Polygonum bistorta* has liver protective effect against carbon tetrachloride induced hepatotoxicity and possess antioxidant activities and extracts exhibited moderate anticancer activity towards cell viability at higher concentration in rats.[17] Root extract of PB (100 mg/kg)is effective against CCl4 induced damage in liver.[21] *Polygonum bistorta* has protective effect against acetaminophen induced liver and kidney damage. Extract (100 mg/kg) and tannic acid (25 mg/kg) reversed in varying degree the changes induced by acetaminophen.[22]

**Anti-inflammatory effect**

BuOH extract of the rhizome of *Polygonum bistorta* exhibited anti-inflammatory effects and a phenylpropanoid substituted catechin, cinchonain was obtained for the first time.[18] Anti inflammatory compounds from the dried rhizome of *Polygonum bistorta* were isolated these compounds are 5-glutinen-3-one and friedelenol.07 Ethanolic extract of *P.bistorta* showed strong anti inflammatory effect.[1]

**Anti bacterial activity**

Methanolic extracts of *Polygonum bistorta* showed significantly different zones of inhibition against *E.faecalis*, *B. subtilis*, *P. aeruginosa* and *S. aureus*, while no activity of any dilution was detected against *S. typhi*. Cold water extracts showed significantly different zones of inhibition against *B. subtilis*, *P. aeruginosa*, *E. faecalis*, *S. typhi* and show no activity against *S.aureus*. Hot water extracts showed significantly different zones of inhibition against *B.subtilis* and *Entereococcus faecalis*, *S. aureus*, *P. aeruginosa* and *S. typhi*.[20]

**Anticancer activity**

Anticancer phenolic compounds and fatty acids were identified from different fractions of methanol-water extract of *Polygonum bistorta* L. possessed good to strong cytotoxicity against HCCLM3 cancer cell line that demonstrated good bioactivity of this herbal plant.[23]
Antifungal effect
Ethanolic extract of *P. bistorta* has good antifungal activity.\(^{[24]}\)

Analgesic effect
The water extract of *Bistortae rhizoma* could significantly reduce continuous pain stimulus by increasing the pain threshold of mice.\(^{[2]}\)

Haemostatic action
The rhizomes of *Polygonum bistorta* L. can be used as a natural non-toxic source of coagulant compounds in medicine and pharmacy. The flour of rhizomes of *Polygonum bistorta* L. has coagulant compounds.\(^{[25]}\)

Effect on rheumatoid arthritis
Water and ethanol extract of *P. bistorta* is affective against rheumatoid arthritis.\(^{[26]}\)

Other studies
In another scenario, Ye Heyang et al showed that the protective effect of extract of *P. bistorta* exerted acute myocardial ischemia in rat. Ethanol extract of Bistortae Rhizoma can enhance mononuclear macrophages phagocytic capacity of normal mice, promote T lymphocytes proliferation, increased serum hemolysin level and IL-2 in mice.\(^{[2]}\)

REFERENCES

