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A COMPREHENSIVE REVIEW WITH PHARMACOLOGICAL POTENTIAL OF "MOTHER OF HERBS" - *ARTEMISIA VULGARIS* LINN

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ABSTRACT

Artemisia vulgaris L. commonly known as Mugwort is a tall, aromatic, bitter, perennial herb that grows wild and abundant usually in mountainous regions in temperate, wet and cold- temperature zones of the world. It belongs to the family Asteraceae. It is commonly practiced in traditional medicine, as it has numerous effective therapeutic uses especially in gynaecology and urology. It is recognized as *Afsantīn-i-Hindi* in Unani system of medicine and is mentioned as a remedy for various ailments by numerous Unani physicians in classical Unani literature and it is one of the component in various compound preparations. Pharmacological studies proved that it acts as emmenogogue, uterine stimulant, hepatoprotective, antidiabetic, antioxidant, CNS stimulant, antispasmodic, anticoagulant, antihyperlipedemic, immunity enhancer, tonic to vital organs, etc. It contains estrogenic flavonoids (eriodictyol and apigenin), flavonoids, phenols, glycosides, tannins and saponins, coumarins, sesquiterpene lactones, volatile oils, etc. This review article will help to elicit the scientific interpretation of the medicinal properties of *Afsantīn* in various remedies as mentioned in Unani system of Medicine.

KEYWORDS: *Artemisia vulgaris* L., *Afsantīn-i-Hindi*, Unani system of medicine, medicinal

properties, pharmacological studies.

INTRODUCTION

Fig. 1: *Afsantīn* Plant.[1,2]

Artemisia vulgaris L. commonly known as Mugwort is designated as 'mater herbarum' or 'mother of herbs' by the Salernitan herbal. This ascertains the drug to be in first rank in medicinal herbs used in gynaecology and urology.[3] It is widely recommended for numerous remedies in Unani system of medicine[3] in which it is recognized as *Afsantīn-i-Hindi*.[4] It comprises of 1,000 genera and over 20,000 species.[5] *Afsantīn* are of 5 types *(Jalinūs): Khurasani, Tarsusi, Susi, Romi* and *Nabti* (considered as the best quality of *Afsantīn,* it is bitter in taste and has a strong smell).[6]

TAXONOMICAL CLASSIFICATION

Kingdom - Plantae

Subkingdom - Tracheobionta

Super division - Spermatophyta

Division - Magnoliophyta

Class - Magnoliopsida

Subclass - Asteridae

Order - Asterales

Family - Asteraceae,[1,4,7,8,9,10,11,12,13,14,15,16] Compositae[4,5,13,17,18]

Genus - *Artemisia* L.[13,14,18,19]

Species - *Artemisia vulgaris* L.[13]

Synonyms - *A. nilagirica* (Clarke)[4]

VERNACULARS: Unani: *Afsantīn-i-Hindi*,[4] *Khitraq*,[20] **Arabic**: *Khitraq*, **Persian**: *Mirdah*,[21] **Urdu:** *Afsantīn*, **Hindi**: Nagdona,[16,22] Nagadouna,[17,23] Dona,[7] **Tamil**: Machipatri,[16,17,22] Maasipattiri,[4] Mashibattiri,[17] **Sinhala**: Walkolondu,[14] **Sanskrit**: Nagadamani,[16,21,22,23] Valamota,[22] Barha,[7] **Ayurveda**: Damanaka, Pushpachaamara, Gandhotkata,[4] **English**: Wormwood,[4,10,16,21] Mugwort,[3,4,8,9,10,16,18] Felon Herb, Motherwort, Sailor's tobacco, Dungwort, Wild Wormwood,[4] Indian Wormwood,[7,22] Western Mugwort, Moxa.[24]

ETHNOBOTANICAL DESCRIPTION

A. vulgaris is a tall,[9,25] aromatic,[9,11,16,18,19,22,26] bitter,[18,20] herbaceous perennial herb.[1,6,10,11,16,19,21,22,25,26] Rhizomes range from a few mm to > 1 cm in diameter, typically branching at the nodes, and reaching depths of 7-18 cm in soil.[27]

Stems resemble *Sa'tar Misri* plant. Initially small and grow larger after the germination of seeds.[6] They are erect, leafy,[22] corrugated lengthwise, simple or branched. Upper stems are purplish and green to brown towards the lower base.[27] Young twigs are pubescent.[6,16]

Leaves resemble *Sa'tar* leaf,[6] alternate,[16] paniculately branched, ovate,[22] pinnately lobed,[16,22,25] dark green above,[16,25,27] and white grey and pubescent beneath.[6,16,22] Lobes are acute, irregularly serrate or lobulated,[22] inflorescence in dropping small head of terminal, compound raceme, minute, oblong- ellipsoid.[16,22] The leaves on the lower portion of the stem are coarsely segmented, with each segment further dissected, middle to upper leaves are smaller, but more coarsely toothed than primary leaves.[27]

Flower heads are nearly sessile or peduncle, seriate or fascicled,[22,27] generally contain 15-30 florets,[27] show a double-branched style and many stamens,[22] the complete disk flowers are strongly aromatic[22,27] and greenish yellow in colour.[16,27] They are similar to *Babuna* flowers, but smaller and have a nodule in between.[6]

Fruits are achene.[16,22]

Seeds resemble *Aspand*.[6] They are ridged, brown, oblong with a narrow base, and have minute bristles at the apex.[27] Mucilaginous, bitter and astringent in taste. Extract of seeds are stronger than that of leaves.[6]

Roots are woody.[22]

HABITAT: *A. vulgaris* grows wild and abundantly in temperate,[1,28] wet[6] and cold-temperature zones of the world.[1,28] It is usually found in mountainous regions (wild & cultivated)[4,16] (up to 2,400m elevation).[9,11] It is natural to the temperate regions of Europe, Asia,[5,10,11,18,19] North America,[5,10,11,18] North Africa,[11,18,19] hilly parts of India[7,11,26] and Sri Lanka.[14] It is mostly found in Himalayas (in middle and upper hill forest up to a height of 2000- 5000 ft.),[7,19] in India and Pakistan,[19] also in Mount Abu in Rajasthan, in Western Ghats, from Konkan southward to Kerala[4] and Kashmir.[20] Flowering of *A.vulgaris* occurs during August - November.[22] Propagation of *A.vulgaris* is by seeds and vegetative methods.[16] During the flowering season the branched tips are gathered and dried. Other fresh above and underground parts of the plant are harvested at the beginning of winter, primarily from the wild.[18]

ACTIONS

Mudirr-i-Bawl (diuretic,)[3,12,18,20,21] *Mudirr-i-Hayḍ* (emmenogogue),[4,17,18,21,24,29] *Mufattiḥ-i-Sudad* (Deobstruent),[6,20,21] *Muḥallil* (anti-inflammatory),[1,10,11,14,21,30,31] *Qātil-i-Kirm-Shikam* (antihelmintic),[2,6,7,10,14,17,20,21,23,24,26] *Dāfi'-i-Ṣafrā*,[6] *Musakkin-i-Dard* (analgesic),[11,18,21,28,30] *Muqawwī-i-Mi'da* (stomachic),[2,6,17,20,21] *Muqawwī-i-Jigar* (Hepatotonic),[21] *Muqawwī-i-Dimāgh* (brain tonic),[21] *Muqawwī-i-Basr* (eye tonic),[22] *Dāfi'-i-Ḥummā* (antipyretic),[11,20,21] *Qābiḍ* (Asringent) (more dominant than *Mufattiḥ*), *Dāfi'-i-Qabḍ* (relieves constipation),[22] Uterine stimulant,[1,12] antibacterial,[2,7,10,11,12,18,19,24,26] antimicrobial,[7,11,18,24,28] antiseptic,[5,12,14,17,18,23,26] antimalarial,[7,12] antifungal,[7,18] antiviral,[1,10,18] larvicidal,[11,18,30] nematicide, pesticide,[11,18] antiplasmodial,[5,14,19] insecticidal,[1,7,10,11,30] insect repellent,[1,10] fumigant,[1] antihypertensive,[1,10] antinociceptive,[19] hepatoprotective,[1,12,19,30] antitumour,[1,2,5,12] anticancer,[5] antioxidant,[1,3,7,8,18,25,27,30] antispasmodic,[7,10,11,12,17,26,32,30] digestive,[1,6,12,18,20,21] carminative,[3,10] appetizer,[7] antidiarrheic,[11] nervine tonic,[3,18,21] CNS-stimulant,[11] anti-epileptic,[12] anti-hysteric, anticonvulsant,[12,19] antineuralgic, anaesthetic,[11] tonic,[7] diaphoretic,[3,18] anticoagulant,[24] anti-rheumatic,[1,12] immunomodulatory,[1] sedative, anti- acne,[11] tonic for vital organs,[26] antidiabetic,[7] expectorant,[11,23,24] bronchodilator,[32] decongestant,[11,24] anxiolytic, anti-allergic,[19] etc.

TEMPERAMENT: Hot2^{o} Dry3^{o},[21] Hot2^{o} Dry2^{o},[20] Hot1^{o} Dry2^{o},[6] Hot$\leq$ 2^{o}Dry1^{o} /2^{o}[3] (*Jalinūs*)

DOSAGE: 4-7g,[20] 2-6 g, 500 mg-2g dried aerial parts,[3] 7g in (Decoction form), 17-25g in (infusion form).[6]

Therapeutic Uses

- Essential oils of *A.vulgaris* act as antioxidant, antimicrobial, antibacterial, antifungal, antiviral, antiseptic, larvicidal, nematicide, pesticide and nervine tonic. It is useful in inflammation, infectious diseases, diabetes, epilepsy and to induce warming effect on the body to counter the effect of cold and moisture in the air.[18] It is also used in flavour and perfumery industry,[11,18] to inhibit the growth of different kinds of insects, microbes, and parasites. It can be employed to protect foods from related deteriorations as a part of natural management practice.[18]
- Infusion of the aerial parts act as antihelmintic, antibacterial, antipyretic, cytostatic, stomachic and anti-tumour.[15] Leaves act as nervine tonic,[4] stomachic (in anorexia & dyspepsia), antihelmintic,[4] choleretic,[4,26] diaphoretic[4] and haemostatic,[22] while roots act as antiseptic and tonic.[22]

Genitourinary system

- *Afsantīn* plant normalizes and tones the reproductive system,[3] and is useful to treat menstrual disorders, leucorrhoea, metrorrhagia, threatened abortion[16] and parturition.[22]
- *Afsantīn* leaves act as emmenogogue and menstrual regulator.[4]
- Vapour bath with strong decoction of *A.vulgaris* followed by fomentation of abdomen with hot bitter herbs like wormwood (*Artemisia absinthium),* tansy *(Tanacetum vulgare)* and hops *(Humulus lupulus)* relieves dysmenorrhoea.[3]
- Decoction of *Afsantīn* is used as emmenogogue[6] in *Iḥtibās al- Ḥayḍ* (amenorrhoea) and *Usr al- Ṭamth* (dysmenorrhea).[21]
- To promote menstruation, facilitate labour or expel the afterbirth:
  - ✓ *Ābzan* (sitz bath) with decoction of *Afsantīn* alone or mixed with other herbs.
  - ✓ *Afsantīn* in the form of *Ḍimād* (paste) is plastered onto the lower abdomen, or mixed with barley flour and applied to the belly, or mixed with red wine, or simply tied onto the belly overnight to induce menstruation.
  - ✓ Decoction of *Afsantīn* leaves (12-15 g) is used orally and pessary prepared from *Afsantīn* juice mixed with *Murr* is used locally.
  - ✓ Mixture of *Afsantīn* leaves is used to induce menstruation in adolescent girls with delayed periods.
- Sitz bath with decoction of *Afsantīn* is useful in uterine closure and inflammation.

- *Afsantīn* dried and used 0.5-2 g three times daily is beneficial in *Futurat-i- Ḥayḍ* (Abnormal Uterine Bleeding) such as dysmenorrhea and amenorrhoea.[3]
- It is beneficial in *'Usr al-Bawl* (dysuria), *Iḥtibās al- Bawl* (retention of urine) and *Mufattit- i Ḥaṣāh Gurda wa Mathāna* (lithotripter for kidney and urinary bladder calculi).[3,22]

Nervous system

- *Afsantīn* whole plant is beneficial in diseases of the nervous system[5] such as *Ḍu'f al-Dimāgh* (weakness of the brain), *Dard-e-Sar* (headache),[21] migraine,[3] *Ra'sha* (tremors),[21] *Fālij* (paralysis),[3,21] *Laqwa* (facial palsy),[21] mental disorders,[22] *Ṣar'* (epilepsy),[3,21] psychoneuroses, neurasthenia, hypochondria, autonomic neuroses, restlessness,[18] general irritability, depression, insomnia,[3,12,18] anxiety[9,11,12,18,26] and stress.[9,11,12,26]
- Young leaves of *Afsantīn* are used as a cautery to relieve neuralgia.[16]
- Infusion of the flower tops of *Afsantīn* is administered in nervous and spasmodic affections.[4]
- Washing the head with mugwort decoction in wine, then laying on hot leaves relieves headache due to cold within an hour.[5]
- *Afsantīn* is used with honey for shock.[21]

Gastrointestinal system

- *Afsantīn* is useful to improve hyperacidity, colic,[3,16] jaundice,[3,21] ascites,[21] dysentery, vomiting,[16] *Ḍu'f al- Mi'da* (weakness of the stomach)[6,22] *wa Haḍm* (and delayed digestion),[3,6,16,22] *wa-Ishtihā'* (anorexia),[3,6,16] *Dīdān al-Am'ā'*(worm infestation)[3,16,21], Bawāsīr (piles)[21] and *Qurūḥ* (ulcers).[22]
- Infusion of the leaves of *Afsantīn* acts as a vermifuge against intestinal worms.[9,26]
- For reversing anal prolapse, fumigation of anus with *Myrrh* and *Colophonia,* followed by application of a hot poultice of mugwort cooked in red wine.[3]
- *Ḍimād* of *Afsantīn* with other medicines can be applied over the abdomen in *Waram al-Jigar* wa *Ṭiḥāl* (hepatitis and splenitis).[6,21]
- *Afsantīn* is beneficial when used with *Bore Armani*, milk and flour of *Sheelam* as *Ḍimād* in *Waram al- Ṭiḥāl wa Mi'da* (hepatitis and gastritis).[21]

Respiratory system

- Extract of the whole plant of *Afsantīn* is beneficial in nasal catarrh.[3]
- Infusion of *Afsantīn* leaves is useful in asthma.[22]

Musculo skeletal system

- Mugwort stem boiled with rose oil is applied locally before going to sleep for blood hardening around joints, ache, shaking and drawing together of the tendon.[3]

Skin

- Whole plant of *Afsantīn* is useful in measles, skin diseases, ulcers[22] and scabs on the head,[3] while the application of leaves in the form of powder or paste is beneficial in skin diseases.[9,18,26]
- The expressed juice of mugwort with honey is applied on discharging wounds, covered with egg white and tied with cloth, and repeated until the corruption is resolved.[3]
- *Afsantīn* in the form of *Ṭilā'* (liniment) is beneficial in bluish discolouration of skin.[21]

Ear, nose and throat

- Steam with decoction of *Afsantīn* is used to treat ear ache,[21] and to resolve otitis media.[6]
- *Afsantīn* syrup is useful in throat inflammations and diphtheria.[6]

Eyes

- *Afsantīn* ointment is beneficial in chronic conjunctivitis while its ointment mixed with alcohol is helpful to relieve pain and inflammation in the eyes.[6]

Other uses

- *Afsantīn* is beneficial to counteract spider poison,[22] acts as a highly effective antidote to insect poison,[9,22] sea-snake bite and goose bite.[6]
- *Afsantīn* is also useful in chronic[6] and periodic fevers,[5] while the extract of the whole plant is beneficial to treat fever.[3]
- *Afsantīn* mixed with any type of oil is used to eliminate bed bugs.[6]

PHYTOCHEMICAL CONSTITUENTS

- *A.vulgaris* grown in different countries possessed qualitative and quantitative differences in their essential oil composition.[11]

✓ Active components are flavonoids,[10,18,26] coumarins,[14,18,26] sesquiterpene lactones,

volatile oils, inulin and traces of alkaloids.[18,26]

- ✓ Organic compounds are phenols, tannins, glycosides and carbohydrates.
- ✓ Inorganic compounds are lead, aluminium, iron, calcium, magnesium, potassium and sodium.[20]
- ✓ Essential oils - cineol,[16,18] α-thujone,[16,18,19,33] β-thujone,[18,33] tetradecatrilin, Dihydromatricariaester, choline, tricosonol, arachyl alcohol,[16] adenine,[15,19] sabinene, caryophyllene oxide,[18] β-pinene and β-caryophyllene.[18,33]
- ✓ It contains estrogenic flavonoids,[29] amyrin, artemisiketone,[19] borneol,[10,19,22] cadinenol,[19] coumarin,[9,11,18,19] fernenol, esculin, esculetin,[19] inulin,[9,19] murolol, myrcene, nerol, molybdenum,[19] quercetin,[9,19] scopoletin, β-sitosterol, spathulenol, stigmasterol, tauremisin, tetracosanol,[19] vulgarin,[9,19] vulgarole, umbelliferone,[19] artemisinin,[14] flavonoids, polyacetylenes, sesquiterpene lactones and sterols.[11]
- ✓ It contains the following volatile oils (chief compounds) - camphor, camphene, α-thujone, germacrene d, 1,8-cineole, and β-caryophyllene[18,26]
- ✓ Lower altitude plants contain more percentage of cineol, thujone, thujyl, while higher altitude plants contain more percentage of terpenes.[4]

PHARMACOLOGICAL STUDIES

- **Emmenogogue activity:** Estrogenic flavonoids from *Artemisia vulgaris* L. such as eriodictyol and apigenin exhibit emmenogogue activity in transgenic yeast.[29]
- **Anti-inflammatory activity:** Flavonoids in *Artemisia vulgaris* leaves were found to possess anti-inflammatory activity in albino-rats.[31]
- **Antioxidant activity:** In vitro results confirmed that *Artemisia vulgaris* leaf extract improves the antioxidant status in oxidatively stressed tissue, which strengthens the antioxidant potential of the plant.[8]
- **Antispasmodic and bronchodilator activities:** In vivo study reported the smooth muscle relaxing effect of *A. vulgaris* mediated probably through the combination of anticholinergic and Ca^{2+} antagonist mechanisms.[32]
- **Antioxidant and Antibacterial activity:** *A.vulgaris* is a rich source of phenolic and flavonoid compounds which exhibit anti-oxidant and antibacterial activity in wistar rats.[12]
- **Antitumor activity**: Methanolic extract induces antitumor effects in HCT-15 human colon cancer cells via autophagy induction, cell migration suppression and loss of mitochondrial membrane potential,[5] due to the presence of Artemisinin extracted from *A.vulgaris*.[26]

- **Anti-hyperlipidemic activity:** *Artemisia vulgaris* root exhibits antihyperlipidemic activity in diet induced hyperlipidemic animal model. The drug showed significant Total Cholesterol, Tri Glycerides, Low Density Lipoproteins lowering activity and significant High Density Lipoproteins increasing activity.[25]
- **Antifertility activity:** Alcoholic extract of aerial parts of *Artemisia vulgaris* L. exhibits antifertility effect on oestrous cycle and implantation in female albino rats.[17]
- **Antimalarial activity:** Ethanolic leaf extract of *A.vulgaris* L. exhibits potent and safe antimalarial activity against Plasmodium berghei murine malarial parasite[19] and Plasmodium yoelii rodent malaria parasites.[11,14]
- **Anticonvulsant activity**: Methanolic extract of *A. vulgaris* leaves exhibits anticonvulsant and anxiolytic properties in mice.[19]
- **Adaptogenic activity:** *Artemisia vulgaris* leaf extract exhibits adaptogenic activity due to the presence of flavonoids, tannins and saponins and has the potential protective effect against stress in wistar rats.[1]

CONCLUSION

In classical Unani literature, *Afsantīn* is recommended by famous Unani physicians for various remedies and is also widely used as a highly effective remedy for numerous ailments in Traditional medicine, even though there are only a handful of scientific studies on human and animals to prove its efficacy. Therefore, further studies are required to prove its medicinal properties in various disorders with specific reference to gynaecological disorders as mentioned in classical Unani literature.

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