

Review article

One for All - *Artemisia absinthium* (Afsanteen) “A Potent Unani Drug”

Ayshah Hashimi¹, Mantasha Binte Siraj², Yasmeen Ahmed³, Md. Akhtar Siddiqui⁴, Umar Jahangir^{5*}

^{1,2,3} M.D. Scholar, ⁴ Professor, ⁵ Assistant Professor Department of Moalajat, School of Unani Medical Education and Research Jamia Hamdard, New Delhi, India

ABSTRACT

The therapeutic use of the wormwood plant *Artemisia absinthium* L. dates back to at least Roman times. There are more than 200 plants in the genus *Artemisia*- including southern wormwood, petite wormwood and Grande wormwood and encompasses about 500 species. The best-known species of wormwood is *Artemisia absinthium*, native to temperate Eurasia and North Africa and is branded for its extreme bitterness. It is a magical greens booze used as carminative to support healthy appetite, balances healthy flora, cleanse the digestive tract of parasite and toxins. It possesses anti-inflammatory, immunomodulatory, hepatoprotective, anti-helminthic and anti-depressant activity. Thujone excites nervous system when taken in small amount. Due to contrary history of wormwood, its application in individuals should be preceded by a thorough and cautious risk-benefit analysis. In this appraisal an attempt is done to validate scientifically, mentioned therapeutic potential of *Artemisia absinthium* in classical Unani literature using PubMed, Science Direct researches.

Keywords Afsanteen, Wormwood, Thujone, Unani, Hepatoprotective

INTRODUCTION

Healing with medicinal plants is as old as mankind itself. Since prehistoric times, in quest for rescue for their disease, the individuals looked for drugs in nature. According to ancient Babylon reports, the use of plants as medicine dates 60,000 years ago. In Greece, written material on herbal medicine dates approximately 2500 years ago. (Msomi, et al., 2018), (Ahamad, et al., 2016), (Dar, et al., 2017), (Petrovska, 2012), (Z, et al., 2017), (Pan, et al., 2014). Plants seems to be safer and potent than conventional biosynthetic drugs (Msomi, et al., 2018). It is stated in scientific literature that up to four billion people (representing 80% of the world's population) rely on herbal medicinal products as a chief basis of healthcare and classical medical practice which comprises the usage of herbs (Ekor, 2014), (Sen, et al., 2017), (Oyebode, et al., 2016), (Merriem, et al., 2013), (Gude, 2013), (Sato, 2012), (Khan, 2016). Medicinal plants are regarded as rich resources of traditional medicines and from these plants many of the modern medicines are produced. According to WHO, around 21,000 plant species have the potential for being used as medicinal plants (Khan, 2016), (Singh, et al., 2018), (Frontasyeva, et al., 2017), (Kumar, et al., 2019). Many herbal drugs pre-own hepatoprotective, immunomodulatory, anti-oxidant, anti-inflammatory, anti-cancer activity, anti-depressant etc. activities (Ramawat, et al., 2009), (Sharma, et al., 2019), (Ramana, et al., 2014), (Kumar, et al., 2015) (Nadkarni, 1989), (ARZĀNI (1134-1722), 1923),

(Chopra, et al., 1956). Asteraceae is regarded as one of the largest and highly advanced family with approximately 1528 (Mukherjee, 2006), (TYROCITY, 2018) or 1620 (Petruzzello, 2018), (Panero, et al., 2012) genera and 22750 or 23600 species of herbs, shrubs and trees. Among the Asteraceae family, *Artemisia* is pharmacologically one of the crucial polymorphic genera that encompasses about 400 (Rustaiyan, et al., 2016), (NWE, 2019) to 500 species (Hussain, et al., 2017), (KURŞAT, et al., 2015), (Shah, 2014), (Abad, et al., 2013), (Abad, et al., 2012), (Bora, et al., 2011), (Ashraf, et al., 2010) and *Artemisia absinthium* commonly known as Afsanteen/wormwood is a well-known herb, native to temperate Eurasia and North Africa and also found in South America. In India, it is found in Kashmir Valley (Ahamad, et al., 2019), (Chopra, et al., 1956), (ENVIS, 2019). Wormwood is mentioned in almost all the herbal medicinal books of Unani Literature and the Western world. During Hippocratic period and by now, this plant is considered as a comprehensive medicine for all diseases owing to its curative medical powers. The methanolic extract of aerial part of *A. absinthium* possesses anti-inflammatory, analgesic, anticancer, hepatoprotective, while essential oil shows antimicrobial (Marwat, et al., 2009), nematocidal activity (Dane, et al., 2016). Different extract shows anti-ulcerogenic, anti-depressant activity (Ahamad, et al., 2019) (Bhat, et al., 2019) (Masoudi, et al., 2017), (Hussain, et al., 2017), (Shafi, et al., 2012), (BORA, et al., 2010). The medical use of *absinthium* is also proved by the freshly published monograph of the European Medicines Agency (HMPC, 2017) and by Southern Cross University (Sherrin, 2008). Afsanteen has robust anthelmintic properties that is why it has been given the name “wormwood” by the prehistoric Egyptians. It is being used in various nervous debilities, liver disorders, skin manifestations etc. In this review paper an attempt is done to compile Unani Literature and Scientific/clinical researches done on wormwood.

*Correspondence: Umar Jahangir

E-mail: umar_jehangir@doctor.com

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Taxonomic Hierarchy (USDA, 2019) (ITIS Report, 2019)

Kingdom	Plantae	Planta, Vegetal plants
Subkingdom	Virdiplantae	Green Plants
Infrakingdom	Streptophyta	Land plants
Super division	Embryophyta	
Division	Tracheophyta	Vascular plant, Tracheophyte
Subdivision	Spermatophytina	Seed plants
Class	Magnoliopsida	
Order	Asterales	
Family	Asteraceae/ Compositae	Sunflowers
Genus	Artemisia L.	Sagebrush, wormwood
Species	Artemisia absinthium Linn.	Absinthium, absinth wormwood, common sagewort

Vernacular Names

Languages	Names	References
English	Absinthe, Wormwood, Sagebrush, Madderwort, Old Women, Green Ginger, Mugwort	(Dymock, et al., 2005), (Bentley, et al., 2009), (Sammamurthy, 2006), (Plant Use, 2011), (Ministry of AYUSH, 2016), (Kirtikar, et al., 1987), (Asolkar, et al., 1992), (Kabiruddin), (Kabiruddin, 1996), (Baitar), (Gani, 1996), (ENVIS, 2019), (Saifuddin, 1990), (Nagzami, 1975), (Goswami), (M.M.P.N.D., 2006), (Singh, 2015), (The J & K Medicinal Plants Introduction Centre, 2013)
Arabic	Ifsinteen, Kashuth	
Persian	Afsanthin, Marwah, Afsatiyun	
Chinese	Ye ai (Cantonese), Yang ai, Ku ai	
French	Armoise, Amere, Genepi, Vermouth	
German	Wermut, Absinth, Bitterer Beifuss, Wurmkraut	
Dutch	alsem, absintalsem	
Spanish	ajenjo, alosna	
Italian	Amarella, Assenzio Selvatico	
Urdu	Afsanteen Rumi, Qaisoom	
Sanskrit	Indhana, Damar, Nagadamini	
Hindi	Vilayathi Afsantin	
Kashmir	Thethwan	
Telugu	Moshipatri, Tartiha	
Punjabi	Mastiyara	
Malyalam	Nilampala, Shulabandha	
Marathi	Sarpana, Surpan	
Kannada	Uruvalu, Urigattige, Davana	
Bengali & Gujrati	Mastaru	

Temperament

Hot² and Dry²

(Ahmed, et al., 2015) (Ibn Rushd/ Averroes (1126-1198), 2001), (Ministry of AYUSH, 2016), (Baitar)

Geographical Distribution

Artemisia absinthium is native to temperate regions of Eurasia and Northern Africa and in India found in Kashmir at altitudes of 1500- 2100 m. (Ansari, et al., 2019) (Ahamad, et al., 2019) (Kabiruddin), (Khare, 2007), (Goswami), (Kabiruddin, 1996)

Morphological Description

Artemisia absinthium is a woody-based perennial herbaceous plant with fibrous roots. The stem is erect, non-woody, hairy, gray-green and 2-3' tall. The leaves are spirally arranged, greenish-grey above and white below, covered with silky silvery-white trichomes, bipinnate to tripinnate with long petioles, its flowers are pale yellow, tubular, and clustered in spherical bent-down heads (capitula), have little ornamental value. Flowering is from early summer to early autumn. Foliage is highly aromatic when bruised.

Microscopically, outer single layer of epidermis of young stem twigs consist of cubical cells with abundant of T-shaped, rather thin-walled trichomes while in mature stem the endodermis has casparian strips while the cortex and pith are parenchymatous. The middle vascular bundle is larger in size showing prominent xylem and phloem layers. The stomata are present on the lower surface. (AHPA, 2015), (MBG, 2018), (Konowalik, et al., 2012), (Ansari, et al., 2019), (Ministry of AYUSH, 2016) (Nadkarni, 1989) (Dymock, et al., 2005)



Fig 1. Afsanteen

Active ingredients of *A. absinthium*

Essential oil	Chamazulene, nuciferol butanoate, nuciferol propionate, caryophyllene oxide, phellandrene, pinene, azulene. [10]-thujone, [9]-thujone, myrcene, trans-sabinyl acetate cis- and trans-epoxyocymenes, chrysanthemyl acetate, thujyl alcohol, nerol, isothujyl acetate. Prochamazulenogen. β-pinene, hydrocarbon monoterpenes, sabinene, 1,8-cineole, Artemisia ketone, linalool, trans-verbenol, carvone, curcumene, neryl butyrate, neryl 2-methylbutanoate, neryl 3-methylbutanoate.
Sesquiterpene lactones	absinthin, artemetin, matricin, isoabsinthin, and artemolin Arabsin, artabin, ketopelenolide, santonin-related lactones
Flavonoid	artemitin, rutin, glycosides of quercetin, chlorogenic, caffeic acids, and
Tannins	
Cartenoids	
Phenolic compounds	syringic, chlorogenic, caffeic acid, ferulic acid, sinapic acid, p-hydroxyphenol acidic acid, vanillic acid, salicylic acid, and p-coumaric acid
Ligans	diayangmbin and epiyangmbin
Glucosides	Absinthin, anabsinthin
Bitter principles	Artamarin, artamaridin, artamaridin, artamarinin quebrachitol, artemitin, rutin, glycosides of quercetin, 24-zeta-ethylcholesta-7,22-dien-3-β-ol

(Bhat, et al., 2019), (Wani, et al., 2014), (Razaeinodhi, et al., 2008), (Msaada, et al., 2015), (Nagzami, 1975), (Kabiruddin, 1996), (Hakim,

2016), (Dymock, et al., 2005), (Sambamurty, 2006), (Asolkar, et al., 1992), (Ministry of AYUSH, 2016)

Pharmacological action with therapeutic uses of *Artemisia absinthium*

Pharmacological Action	Therapeutic uses	Unani & Ethnobotanical References
Hepatoprotective (<i>Muqawwī-i-Jigar</i>)	Liver Disorders: Viral and Non-Viral Hepatitis, Ascites, Splenomegaly, Jaundice, Hepatomegaly, Fatty Liver, Cirrhosis of Liver	(Qasmi, 2015), (Khan, 1993), (Ajmal, 1995), (Qershī, 2012) (Hakim, 2016), (Baitar, (Gani, 1996), (Goswami)
Chloretic (<i>Mushil-i-Safra</i>)		(Kabiruddin, 1996)
Appetizer (<i>Mushtahī</i>)		(Kabiruddin), (Nagzami, 1975), (Saifuddin, 1990), (Ibn Sina/Avicenna (980-1037 A.D.), 1933), (Al-Majusi/ Haly Abbas (930-994), 2010) (Al-Razi/Rhazes (865-925 A.D.), 2000), (Rabban al-Tabari (780 850 AD), 2002), (Placeholder2), (Al-Razi/Rhazes (865-925 A.D.), 1980) (ARZĀNĪ (1134-1722), 1923), (Khan, 2016)
Carminative (<i>Kāsir-i-Riyāh</i>)		
Astringent (<i>Qābid</i>)		
Anthelmintic (<i>Qātil-i-Didān-i-Am ‘ā’</i>)	GIT Disorders: Gastritis, Indigestion, Anorexia, Flatulence Chron’s Disease, Piles, Fissures, Worm Infestation	
Anti-inflammatory (<i>Muhallil-i-Waram</i>)		
Anti-oxidant		
Immunomodulator		
Analgesics (<i>Musakkin-i-Alam</i>)	Sprain, Rheumatism, Gout	
Antipyretic (<i>Dāfi ‘-i-Hummā</i>)	Fever	
Diaphoretic (<i>Mu‘arriq</i>)		
Antimalarial	Malaria Skin diseases	
Antimicrobial		
Antiseptic (<i>Dāfi ‘-i-Ta ‘affiū</i>)		
Detergent (<i>Jālī</i>)	Depression, Facial Palsy, tremors, weak memory, convulsions, epilepsy, stroke	(Nadkarni, 1989), (Dymock, et al., 2005), (Bentley, et al., 2009), (Sambamurty, 2006), (Chopra, et al., 1956), (Asolkar, et al., 1992), (Kirtikar, et al., 1987), (Ministry of AYUSH, 2016)
Brain tonic (<i>Muqawwī-i-Dimāgh</i>)		
Antidepressant		
Narcotic	Cancer	
Anti-cancer	Amenorrhoea	
Anaphrodisiac (<i>Qāti ‘-i-Bāh</i>)		
Emmenagogues (<i>Mudirr-i-Hayd</i>)		
Insecticidal	Pesticide	

There is plethora of reports of experimental and clinical evidences related to its innumerable activity

Hepatoprotective

- Hepatocurative Effect of *Saussurea lappa* C.B Clarke and *Artemisia absinthium*, Linn in Chronic Hepatitis B (Ansari, et al., 2018)
- Ameliorative effects of *Qurs-e-Afsanteen* on Gentamicin induced Hepatotoxicity and Oxidative stress in rabbits (Aziz, et al., 2017)
- In vivo hepatoprotective activity of the aqueous extract of *Artemisia absinthium* L. against chemically and immunologically induced liver injuries in mice (N, et al., 2010)

- Hepatoprotective activity of aqueous-methanol extract of *Artemisia vulgaris* [Journal] // Phytotherapy Research (Ghilani , et al., 2005)
- Preventive and curative effects of *Artemisia absinthium* on acetaminophen and CCl4-induced hepatotoxicity (Ghilani, et al., 1995)

Anti-inflammatory

- Natural Treatments for Fissure in Ano Used by Traditional Persian Scholars, Razi (Rhazes) and Ibn Sina (Avicenna) (Derakshan, 2016)
- Anti-inflammatory, Antioxidant and Antimicrobial Effects of Artemisinin Extracts from *Artemisia L.* (Kim, et al., 2015)
- Anti-inflammatory and Analgesic Activities of *Artemisia absinthium* and Chemical Composition of its Essential Oil (Hadi, et al., 2014)

Anti-helminthic

- Therapeutic efficacy of *Artemisia absinthium* against *Hymenolepis nana*: in vitro and in vivo studies in comparison with the anthelmintic praziquantel (EVN, 2018)
- Flavonoids and Sesquiterpene Lactones from *Artemisia absinthium* and *Tanacetum parthenium* against *Schistosoma mansoni* Worms (Almeida, et al., 2016)
- Anthelmintic activity of extracts of *Artemisia absinthium* against ovine nematodes (Tariq, et al., 2009)
- Steroid-sparing effect of wormwood (*Artemisia absinthium*) in Crohn's disease: a double-blind placebo-controlled study (Omer, et al., 2007)
- Taxonomic Study and Medicinal Importance of Three Selected Species of the Genus *Artemisia* Linn (Qureshi, et al., 2002)

Anti-oxidant

- Role of wormwood (*Artemisia absinthium*) extract on oxidative stress in ameliorating lead induced haematotoxicity (Kharoubi O, et al., 2008)

Immunomodulator

- Estragole and methyl-eugenol-free extract of *Artemisia dracunculoides* possesses immunomodulatory effects (Froushani, et al., 2016)
- *Artemisia absinthium* and *Artemisia vulgaris*: A comparative study of infusion polysaccharides (Corrêa-Ferreira, et al., 2014)

Analgesics

- Topical Effects of *Artemisia Absinthium* Ointment and Liniment in Comparison with Piroxicam Gel in Patients with Knee Joint Osteoarthritis: A Randomized Double-Blind Controlled Trial (Basiri, et al., 2017)
- Anti-inflammatory and Analgesic Activities of *Artemisia absinthium* and Chemical Composition of its Essential Oil (Hadi , et al., 2014)
- Anti-inflammatory and analgesic effect of herbal preparation: septilin. [Journal] // Indian Journal of Medical Sciences. (Khanna, et al., 2001)

Appetizer

- The effect of hydro-alcoholic extract of *Artemisia absinthium* on appetite in male rats (Taraghdari, et al., 2015)

Anti-pyretic

- Chemical Composition and Antioxidant and Antimicrobial Activities of Wormwood (*Artemisia absinthium* L.) Essential Oils and Phenolics (Msaada, et al., 2015)
- Anti-inflammatory and Analgesic Activities of *Artemisia absinthium* and Chemical Composition of its Essential Oil (Hadi, et al., 2014)
- Antipyretic studies on some indigenous Pakistani medicinal plants (Khattak, et al., 1985)

Anti-microbial

- Antimicrobial Activity of *Artemisia absinthium* Against Surgical Wounds Infected by *Staphylococcus aureus* in a Rat Model (Vieira, et al., 2017)
- Volatile composition and antimicrobial activity of the essential oil of *Artemisia absinthium* growing in Western Ghats region of North West Karnataka, India (Joshi, 2013)
- Antimicrobial Activity of *Artemisia absinthium* Against Surgical Wounds Infected by *Staphylococcus aureus* in a Rat Model (Moslemi, et al., 2012)
- Steroid-sparing effect of wormwood (*Artemisia absinthium*) in Crohn's disease: a double-blind placebo-controlled study (Omer, et al., 2007)

Diuretic

- Seasonal variation in the chemical composition, antioxidant activity, and total phenolic content of *Artemisia absinthium* essential oils (Mohammadi, et al., 2015)
- Total phenolic, flavonoids and tannin contents in different extracts of *Artemisia absinthium* (Singh, et al., 2012)
- Composition of the Essential oil of *Artemisia absinthium* from Tajikistan (Sharopov, et al., 2012)

Anti-depressant

- GABA-A Receptor Modulation and Anticonvulsant, Anxiolytic, and Antidepressant Activities of Constituents from *Artemisia indica* Linn (Khan, et al., 2016)
- Chemical Composition and Antioxidant and Antimicrobial Activities of Wormwood (*Artemisia absinthium* L.) Essential Oils and Phenolics (Msaada, et al., 2015)
- Seasonal variation in the chemical composition, antioxidant activity, and total phenolic content of *Artemisia absinthium* essential oils (Mohammadi, et al., 2015)
- Antidepressant and antioxidant activities of *Artemisia absinthium* L. at flowering stage (Mahmoudi, et al., 2009)

Narcotic

- Trypanocidal, trichomonocidal and cytotoxic components of cultivated *Artemisia absinthium* *Linnaeus* (Asteraceae) essential oil (Martínez-Díaz, et al., 2015)

- Chemical Composition of the Essential Oil of *Artemisia absinthium* Growing Wild in Iran (Razaeinodehi, et al., 2008)

Anti-cancer

- *Artemisia absinthium* (AA): a novel potential complementary and alternative medicine for breast cancer (Shafi, et al., 2012)

Emmenagogues

- Effects of *Artemisia monosperma* ethanolic leaves extract on implantation, mid-term abortion and parturition of pregnant rats (Hijazi, et al., 2010)
- Ethnomedicines used in Trinidad and Tobago for reproductive problems (Lans, 2007)
- Herbal infusions used for induced abortion (Ciganda, et al., 2003)
- Herbal medicinal products during pregnancy: are they safe? (Ernst, 2003)
- Absinthe and γ -aminobutyric acid receptors (Olsen, 2000)

Clinical studies on *Artemisia absinthium*

Chronic Hepatitis B	(Ansari, et al., 2019), (Ansari, et al., 2018)
Fatty Liver	(Kim, et al., 2016), (Ahmed, et al., 2015)
Jaundice	(Taraghdari, et al., 2015), (Okuno, et al., 2015)
Ascites	(WeI, et al., 2019), (Ansari, et al., 2018)
Cirrhosis of Liver	(Kim, et al., 2016), (Mohammadian, et al., 2015)
Anorexia	(Taraghdari, et al., 2015)
Chron's Disease	(S, et al., 2010) (Omer, et al., 2007),
Piles	(Hashempur, et al., 2017)
Fissures	(Derakhshan, 2017)
Worm Infestation	(EVN, 2018)
Depression, Paralysis Weak Memory, Stroke Tremors, Convulsion	(N, et al., 2016), (BORA, et al., 2010) (Kharoubi O, et al., 2008)
Osteoarthritis	(Basiri, et al., 2017)
Anemia	(Kharoubi O, et al., 2008)

Adverse effect

- Nausea & Vomiting
- Headache
- Dryness
- CNS Toxicity (hallucination, seizures, numbness, numbness, restlessness, tremors, etc)
- Insomnia

(Ogbru, 2019), (WebMD, 2019), (Singh, 2015)

CONCLUSION

Plants seems to be safer at the same time being effective than conventional biosynthetic drugs in the management of different ailments. *A. absinthium* is indexed in endangered category, so consistent efforts should be made to shield this plant species from becoming extinct and it will be useful to nurture this plant at a large scale. Various experiments have demonstrated its

hepatoprotective, anticancer, antimalarial, anthelmintic, anti-inflammatory, antidepressant, antiulcer, immunomodulatory and antioxidant activities. Above mentioned studies done so far on the *A. absinthium* confirm the claims of traditional use of this plant but. In the recent years main focus has been on the phytochemical studies to get acquainted with many unknown and known ingredients that can be screened for their therapeutic potential to treat severe health disorders without any side effects. Wormwood has immense potential for researchers and exploring it will lead to identification of new compounds which could be used as drugs for curing common and critical diseases.

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CONFLICT OF INTEREST

The authors have no conflicting financial interests.

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