



## A REVIEW OF ARTEMISIA ABSINTHIUM, LINN. (AFSANTEEN) WITH SPECIAL REFERENCE OF UNANI MEDICINE

Shabnam Ansari <sup>1\*</sup>, Yasmeen Shamshi <sup>2</sup>, Qamar Alam Khan <sup>3</sup>

<sup>1</sup>Department of Biotechnology, Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi, India

<sup>2</sup>Department of Moalajat, School of Unani Medical Education and Research, Jamia Hamdard, New Delhi, India

<sup>3</sup>Majeedia Unani Hospital, Jamia Hamdard, New Delhi, India

\*Corresponding Author Email: drshabnamansari.md@gmail.com

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### ABSTRACT

The Unani drug 'Afsanteen' of botanical name *Artemisia absinthium*, Linn. is a perennial plant found in Kashmir, Nepal and mountainous district of India. Dried sample of drug consists of broken stem, twigs, leaves and flower head. Powder form of drug is brownish yellow in colour. Traditionally, 'afsanteen' has been used by Unani (Greek) physicians in diverse diseases like jaundice, fever, anorexia, hepatitis, cirrhosis, hepatobiliary obstruction, epilepsy, gout and rheumatism, ascites, haemorrhoids, anal fissures, weak memory, helminthic infestation, Scorpio bite, chronic conjunctivitis, dark circles, eye diseases, otorrhoea, tinea capitis, dyspepsia, indigestion, amenorrhoea, sexual debility and as mosquito and insect repellent etc. This plant contains substance called sesquiterpene lactones; these are strongly insecticidal and give drug bitter taste. The dry leaves and stems contain essential oil, absinthin, anabsin, anabsinthin, artabsin and matricin which have anti-inflammatory, antimicrobial, antifungal, antiseptic, strong hepatoprotective, neuroprotective, antidepressant, antiaging and antioxidant activity. This article provide review of common names, temperament, description of plant, pharmacological actions, therapeutic uses, experimental studies, adverse effects, contraindication, dose, corrective, alternative and important compound formulation of *Artemisia absinthium* through illustrations. Many actions and therapeutic uses of 'afsanteen' previously not reported in other articles have also been mentioned in the present paper.

**Keywords:** Afsanteen, *Artemisia absinthium*, ethnomedicine, hepatoprotective, Unani medicine

### INTRODUCTION

*Artemisia absinthium*, Linn. (Absinthium/ Wormwood) is a perennial plant of family Asteraceae or Compositae known as 'afsanteen' in Unani system of medicine.<sup>1-11</sup> Dried herb, leaves and flowering tops<sup>1, 8, 12, 15</sup> of 'afsanteen' have been used in Unani system of medicine. The herb is utilized in various preparation forms such as arq, sharabat, decoction etc. It is now official in the British Pharmacopeia and Pharmacopeia of India.<sup>16</sup>



Figure 1: *Artemisia absinthium* Plant

### TAXONOMICAL CLASSIFICATION<sup>1, 2</sup>

Kingdom	Plantae
Sub-kingdom	Tracheobionta – Vascular plants
Super-division	Spermatophyta – Seed plants
Division	Magnoliophyta – Flowering plants
Class	Magnoliopsida – Dicotyledons
Subclass	Asteridae
Order	Asterales
Family	Asteraceae <sup>1-7</sup> Compositae <sup>1, 3, 8-11</sup>
Genus	<i>Artemisia</i> L. – sagebrush
Species	<i>Artemisia absinthium</i> L. – absinthium

### COMMON NAMES [Table 1]

Table 1: Common Names of <i>Artemisia absinthium</i>		
Language	Common names	References
English	Absinthe, madderwood, American or common wormwood, mugwort or madder wort, sagebrush, southern wood, mingwort, old woman, warmot, wermuth and wormwood sage	1-4, 8, 12-17
Arabic	<i>Khatraq</i>	1, 8, 14, 15, 17, 18

<b>Persian</b>	<i>Marwah, afsanteen rumi, marw</i>	1, 3, 8, 14, 15, 18
<b>Urdu/ Unani</b>	<i>Afsanteen</i>	1, 4, 8, 12, 15, 17, 18
<b>German</b>	<i>Aelsch, allsam, allsei, alsam, alsch, baermede, bitter alsen</i>	13
<b>Greek</b>	<i>Apsinthion</i>	13
<b>Hindi</b>	<i>Vilayathi afsanthin, satadoo</i>	1, 3, 8, 15, 19
<b>Sanskrit</b>	<i>Indhana, damar</i>	3, 8
<b>Bengali &amp; Gujarati</b>	<i>Mastaru</i>	1, 3, 8, 15
<b>Kannada</b>	<i>Urittige, urivalu</i>	1, 8, 15
<b>Malayalam</b>	<i>Nilampala, tirunitripachcha</i>	1, 3, 8, 15
<b>Marwari</b>	<i>Damar, indhana</i>	1, 3, 8, 15
<b>Tamil</b>	<i>Machipatri</i>	1, 3, 8, 15
<b>Telugu</b>	<i>Maachipatri, tartiha</i>	1, 3, 8, 15
<b>Kashmir</b>	<i>Tethwen</i>	1, 3, 8, 12, 15

**TEMPERAMENT:** (Hot 1<sup>0</sup> Dry 3<sup>0</sup>)<sup>14, 15, 19, 20</sup> or (Hot 2<sup>0</sup> Dry 2<sup>0</sup>)<sup>8, 10, 17</sup> or (Hot 1<sup>0</sup> Dry 2<sup>0</sup>)<sup>18, 21</sup>

**DISTRIBUTION / HABITAT:** North Asia- Kashmir, Nepal and Mountainous district of India 5000-7000 ft.<sup>1, 8, 10, 13, 15</sup> Habitat also found in Afghanistan, westward to the Atlantic<sup>10, 13</sup> and throughout Europe, Northeastern United States, the Midwest, the Great Plains, and Canada.<sup>2, 6, 10, 16, 22</sup>

**DESCRIPTION:** Aromatic, pubescent, silky, intensely bitter astringent<sup>8, 18 19, 21</sup> with unpleasant odor shrubby and perennial plant, 100 cm in height and occur throughout the year. Flowering and fruiting take place from July to September. So collection is usually done in these months. The species is main source of ‘Afsanteen’ used in India. [Figure 1]

**Stem:** Erect, angular, hoary and ribbed, 0.3-0.9 m. **Leaves:** Ovate to obovate, unequally 2-3 pinnatifidly cut into spreading linear or lanceolate-obtuse segments, hoary on both surfaces, 2.5-5 cm.<sup>10, 18</sup> **Flower:** About 40 in a head 8.6 mm diam., heterogamous (outer row female, inner bisexual or male), numerous nut hardly crowded, flower yellow, ray florets dilated below.

**Outer involucre bracts oblong:** Hoary, narrowly scarious. **Inner orbicular:** Broadly scarious. **Receptacular hair:** Long, straight.

**Achenes:** Elliptic-oblong, 1mm long. **Fruit:** Small, obovoid, smooth, without a pappus or crown of any sort.

**Microscopic:** Stem in transverse section shows a prominent wavy outline. The younger stem and twigs shows outer single layer of epidermis which consist of cubical cells. Many of epidermal cells extend outwards to form trichomes. The epidermis followed by cortical portion 4-6 layers of collenchymatous cells endodermis is of parenchymatous cells.<sup>1, 3, 4, 12, 13, 15, 16</sup>

**Dried sample:** Of drug consists of broken stem, twigs, leaves and flowers heads. The powdered drug is brownish in colour. On examination, characteristic non-lignified hairs were found to be T

shape. The hairs have 1-4 cell stalk and are collapsed twisted and broken glandular hairs, stalk 1-2 celled, glandular portion consisting of 4-8 secreting glands surrounded by membranes. The trichomes of leaf fragment are either with a single cell stalk and with bi-cellular head or multicellular stalk is with unicellular head.<sup>1, 3, 4, 12, 13, 15, 16</sup>

### CHEMICAL CONSTITUENTS

- Volatile essential oil
- Absinthin- a bitter glycoside (active principle) very soluble in alcohol but less so in ether, slightly in water
- Anabsinthin- Bitter substance
- Absinthic acid identical as succinic acid
- Artemetin- crystalline compound
- Artabsin
- Azulin- best sources (40-70 mg)<sup>1, 3, 5, 8-10, 12, 13, 15, 16, 22</sup>

Tannins/ phenols, resins, succinic acid, maltes, nitrates of potassium, lead, aluminum, iron, calcium, magnesium, sodium and ash. The bitter taste of wormwood is from sesquiterpene lactones (0.15-0.4%)<sup>26</sup>- absinthin and artabsin being the main ones<sup>23- 25</sup> and guainolides.<sup>26</sup>

**Volatile oil:** Also known as ‘Absinthe’ or ‘Wormwood Oil’ is having a camphoraceous odor and dark brown or yellow color is obtained by distillation. Oil yield varies from 0.12 to 0.52% (fresh basis). It contains thujone or absinthol, thugyl alcohol, cadinene, phellandrene, pinene, S-guaiazulene, turpenes 2 p. c., and a deep blue oil. Absinthin is an intensely bitter, white or yellowish brown glycoside very soluble in alcohol and chloroform but slightly so in ether and water. **Seed oil:** Seeds yield 33.4% of oil contains iod val, 118 and sap val, 186. The fatty acids composition contains oleic, linoleic, palmitic, stearic and oxirane acids.<sup>1, 3, 5, 8-10, 12, 13, 15, 16, 22</sup>

**Aqueous extract:** Phytochemical analysis revealed sesquiterpene lactones, flavonoids, phenolic acids and tannins.<sup>27</sup>

### PHARMACOLOGICAL ACTIONS (AF’AL-O-KHAWAS) OF ARTEMISIA ABSINTHIUM IN UNANI MEDICINE AND ETHNO-MEDICINE [Table 2]

S. No.	Action of drug	Unani references	Ethno-botanical references
1.	Hepatoprotective/ Liver tonic ( <i>Muqawwi-e-Jigar</i> )	8, 10, 18, 21, 28, 29	
2.	Anti-inflammatory ( <i>Muhallil-e-Warm</i> )	8, 10, 14, 15, 18-20, 28	22, 30, 31
3.	Analgesic ( <i>Musakkin-e-Alam</i> ) (Esp. stomach, liver, uterine)	8, 10, 18, 20	
4.	General tonic ( <i>Muqawwi-e-Aam</i> )	14, 17	1, 22
5.	Diuretic ( <i>Mudirr-e-Bawl</i> )	8, 10, 14, 18-20, 21, 28	

6.	Purgative of Bile ( <i>Mus'hil-e-Safra</i> )	8, 18, 19	
7.	Appetizer ( <i>Mushtahi</i> )	28	8
8.	Antipyretic ( <i>Dafti-e-Humma</i> )	8, 10, 15, 17, 32, 33	1, 8
9.	Brain tonic ( <i>Muqawwi-e-Dimagh</i> )	8, 10	8
10.	Antidepressant		8, 22
11.	Deobstruent ( <i>Mufatthi-e-Sudad</i> )	8, 10, 14, 15, 17, 18, 19, 21, 28, 33	8
12.	Diaphoretic ( <i>Mu'arriq</i> )	14	8
13.	Anthelmintic ( <i>Qatil-e-Kirm-e-Shikam/ Mukhrij-e-Didan</i> )	8, 10, 14, 15, 17, 19, 34	1, 4, 8, 12, 13, 16
14.	Antiseptic ( <i>Dafti'-e-Ta'affun</i> )	6, 10, 17	8, 13
15.	Oil (Narcotic)		1, 8
16.	Digestive tonic ( <i>Muqawwi-e-Me'da</i> )	8, 10, 15, 17, 18, 19, 21, 28, 32	1, 3, 6
17.	Chloretic		22
18.	Carminative ( <i>Kasir-e-Reyah</i> )		22
19.	Anaphrodisiac ( <i>Qata-e-Bah</i> )	15	
20.	Emmenagogue ( <i>Mudirr-e-Haez</i> )	8, 10, 18, 19, 20, 28	
21.	Astringent ( <i>Qabiz</i> )	10, 19, 20, 28	
22.	Laxative ( <i>Mulayyin</i> )	10	
23.	Detergent ( <i>Jali</i> )	10	
24.	Insecticidal/ Antiparasitic	10, 18, 19	22

## THERAPEUTIC USES [Table 3]

S. No.	Uses	Unani references	Ethnobotanical references
1.	Hepatitis & Hepatomegaly ( <i>Warm-e-Jigar</i> )	8, 10, 14, 15, 18, 19	1
2.	Jaundice ( <i>Yaraqan</i> )	[4, 18, 19	
3.	Splenomegaly ( <i>Warm-e-Tihal</i> )	8, 10, 14, 15, 18, 19, 28, 34	
4.	Cirrhosis ( <i>Salabat-e-Jigar</i> )	19	
5.	Obstruction in hepato-biliary system ( <i>Sudda-e-Jigar</i> )	10, 21, 28	
6.	Gastritis ( <i>Warm-e-Me'da</i> )	18	22
7.	Weak memory ( <i>Zauf-e-Dimagh</i> )	8, 10, 15	
8.	Depression		8, 22
9.	Crohn's disease ( <i>Warm-e-Am'a</i> )	18	
10.	Anorexia ( <i>Zauf-e-Ishteha</i> )	10, 18, 19	6, 22
11.	Tremors ( <i>Ra'sha</i> )	8, 10, 15	
12.	Ascites ( <i>Istisqa</i> )	8, 14, 19, 28	
13.	Paralysis and facial palsy ( <i>Falij wa Laq'wa</i> )	8, 10, 15, 28	
14.	Piles ( <i>Bawaseer</i> )	8, 10, 15, 18, 19	
15.	Fissure ( <i>Shiqaq-e-Maqad</i> )	18, 19	
16.	Sprain or bruise ( <i>Watha/ Radd</i> )		1, 8, 12
17.	Convulsion & cephalgia ( <i>Tashan'nuj &amp; Suda</i> )	8	
18.	Gout & rheumatism ( <i>Niqras &amp; Hudar</i> )	14	1, 3, 4, 8, 12
19.	Dyspepsia and indigestion ( <i>Zauf-e-Hazm</i> )	8, 14, 18	8, 13, 16, 22
20.	Hysteria ( <i>Ikhhtinaq-ul-Reham</i> )		8
21.	Epilepsy ( <i>Sar'a</i> )	8, 15	8, 16
22.	Nervous irritability	10	8
23.	Worm infestation ( <i>Didan-e-Am'a</i> )	8, 10, 15, 17, 18, 20	8, 12, 16, 22
24.	Skin diseases ( <i>Amraz-e-Jild</i> )		8, 22
25.	Foot ulcer/ Ulcers ( <i>Quruh</i> )	10, 19	8, 31
26.	Fevers/ Chronic fever ( <i>Humma</i> )	8, 10, 14, 15, 18, 19, 34	1, 8, 12, 13, 16
27.	Debility of GI tract ( <i>Zauf-e-Nizam-e-Hazm</i> )	8, 18	13
28.	Amenorrhea and dysmenorrhea ( <i>Ehtebas-e-Haez/ Usr-e-Haez</i> )	8, 18	
29.	Cosmetic ( <i>Rang nikharna</i> )	10, 18, 19	
30.	Otalgia ( <i>Dard-e-gosh</i> ) otitis, diphtheria	10, 18, 19	
31.	Stroke ( <i>Sakta</i> )	10, 19	
32.	Conjunctivitis/ pterygium ( <i>Aashub-e-Chashm/ Nakhuna</i> ) & hemorrhage	10, 18, 19	
33.	Dark circles	10, 18	
34.	Improve vision ( <i>Binaayi ko tez</i> )	18	
35.	Anemia ( <i>Su-ul-Qinya</i> )	10	
36.	Scorpio bite, <i>Shokran</i> poisoning	18, 19	22
37.	Prevent Hang over	18, 19	
38.	Moxibustion treatments for cancer		31

## EXPERIMENTAL STUDIES/ PHARMACOLOGICAL EVIDENCE [Table 4]

Table 4: Experimental Studies on <i>Artemisia absinthium</i>					
S. No.	Action	Form	Model used	After treatment	Reference
1.	Hepatoprotective	Aqueous extract	CCL <sub>4</sub> induced rat model	Prevented increase in liver enzymes. Attenuated hepatocellular necrosis.	Amat et al., 2010. <sup>27</sup>
		Aqueous-methanolic extract	CCL <sub>4</sub> induced mice	Prevented rise in SGOT, SGPT. Inhibitory effect on microsomal drug metabolizing enzymes.	Gilani et al., 1995. <sup>35</sup>
2.	Immuno-modulator	Aqueous extract	LPS induced mice model	Modulated TNF and IL activity.	Amat et al., 2010. <sup>27</sup>
3.	Anti-oxidant	Aqueous extract	CCL <sub>4</sub> induced rat	Scavenging effect on DPPH & H <sub>2</sub> O <sub>2</sub> .	Saxena et al., 2012. <sup>36</sup>
			Lead induced RBC in wistar rat	Prevent lipid peroxidation, reduced ROS activity, GSH, Vitamin C, E and NP-SH.	Kharoubia et al., 2008. <sup>37</sup>
		Methanolic extract	<i>In vitro</i>	DPPH scavenging activity	Fidrianny et al., 2015. <sup>38</sup>
4.	Anti-inflammatory	Oil	Albino mice	Reduced carrageenan induced paw edema	Hadi et al., 2014. <sup>39</sup>
5.	Analgesic	Aqueous extract	Mice	Antinociceptive effect at 4 and 6% W/V in tail flick model test.	Zeraati et al., 2014. <sup>40</sup>
6.	Appetizer	Liquid preparation	Humans	Stimulated gastric secretion when it was given orally five minutes before a meal.	Mills & Bone, 2000. <sup>41</sup>
7.	Anti-depressant	Methanolic extract	Albino mice	Similar activity as imipramine 10 mg kg <sup>-1</sup> (p > 0.05) in Tail Swimming Test (TST).	Ahmoudi et al., 2009. <sup>42</sup> Hadizadeh et al., 2009. <sup>60</sup>
8.	Neuro-protective/ Brain tonic	Ethano-lic extract	Human cerebral cortical cell membrane	Exhibited cholinergic activity. Differential displacement at nicotinic and muscarinic acetylcholine receptors.	Wake et al., 2000. <sup>43</sup>
9.	Anti-bacterial	Essential oil	Gram + & - bacteria	Inhibited growth of <i>E. coli</i> , <i>staphylococcus</i>	Lopez-Lutz et al., 2008. <sup>44</sup>
10.	Anti-fungal	Oil	Fungi	Inhibited growth of yeast, dermatophytes, <i>aspergillus</i> etc.	
11.	Toxicity study	40 Wistar hannover (GALAS) rats	In 13 wk., no toxicity was observed in the body wt., hematological, serum biochemical examination (LFT, KFT, S. Proteins), organs wt. (brain, liver, kidney, ovary, heart, lungs & others) & their histo-pathological examinations.		Muto et al., 2003. <sup>45</sup>
12.	Antiviral	Decoction in humans	Exhibited suppressive effect on hepatitis B viral DNA, HBsAg and HBeAg		Ansari et al., 2018. <sup>50</sup> Siddiqui et al., 2016. <sup>51, 52</sup>
13.	Hepatocurative	Decoction in humans	Normalized raised LFT of chronic hepatitis B patients		Ansari et al., 2018, 2016. <sup>53, 54</sup> Zaman et al., 2014. <sup>55</sup>
14.	Antitumor	Methanolic extract	Checked MCF-7 and MDA-MB-231 cell proliferation		Emami et al., 2009. <sup>56, 57-59, 61</sup>
15.	Antipyretic	Aqueous, hexane & chloroform extract	Antipyretic activity comparable to potency of aspirin against subcutaneous yeast injections in rabbits.		Khattak et al., 1985. <sup>62, 63, 64</sup>
16.	Antiulcer	Ethanol, hexan, chloroform, CCl <sub>4</sub> & methanol	Antiulcer effects on acetylsalicylic acid induced ulcers in rats		Shafi et al., 2004. <sup>65</sup>
17.	Anti-helminthic	Volatile oil	Anthelmintic activity		<sup>66-71</sup>
		Aqueous	Exhibit anthelmintic activity in comparison to albendazole against the gastrointestinal nematodes in sheep.		Singh et al., 1994. <sup>72</sup>
		Aqueous & ethanolic	In vitro, both extracts reduced the motility of <i>Haemonchus contortus</i>		Tariq et al., 2009 <sup>73</sup>

18.	<b>Cell stability activity</b>	Flavonoids	Protection of human erythrocytes (RBC) against hypotonic shock.	De Freitas et al., 2008. <sup>74</sup>
19.	<b>Antiprotozoal</b>	Extract Essential oil	Against Trypanosoma brucei, T. cruzi and Leishmania infantum. Antileishmanial activity	Valdes et al., 2008. <sup>75</sup> Tariku et al., 2011. <sup>76</sup> Bailen et al., 2013. <sup>77</sup> 78-80
20.	<b>Hypolipidemic</b>	Ethanollic extract	Reduces serum cholesterol and triglyceride by 8 and 3.5 times, respectively in rabbits	81-83

**ADVERSE EFFECTS** [Table 5]

S. No.	Effect	Form	Unani references	Ethno botanical references
1.	Headache ( <i>Sudae</i> )	Long term inhalation Dry extract ( <i>Usarah</i> ) in large doses	8, 18-20	1, 13, 16
2.	Dryness ( <i>Khushki</i> )		18, 19	
3.	Narcotic poisoning	Oil		1, 8
4.	CNS toxic (Trembling in hands and tongue / convulsions/ epilepsy)	Oil excessive use of liquor (oil) with alcohol		6, 16, 46-48, 84-87
5.	Insomnia			22, 49

**CONTRADICTIONS:** a) Avoid during pregnancy & breast feeding<sup>49</sup> or b) Hyperacidity and peptic ulcers or c) Allergic to sesquiterpene.<sup>22</sup>

**DOSE**

- Powder drug:** 4-9 g<sup>15, 28</sup> or 5-7 g<sup>17</sup> or 2-5 g<sup>8, 10</sup> or 4.5-7 g<sup>18</sup> or 10-60 grains.<sup>8</sup>
- Decoction:** 17.5 ml- 24.5 ml.<sup>18</sup> Oil as flavoring ingredient of absinthe liqueur but now prohibited.<sup>1, 8</sup>
- Tea or tincture:** Containing the equivalent of 2-3g of the herb divided into 2 or 3 doses orally for not more than 2 weeks.<sup>7</sup>
- Extract:** 500mg/kg twice daily for a 60 kg human is 30g - 15-30 times the recommended daily therapeutic amount.<sup>35</sup>
- LD<sub>50</sub>:** 3700 mg/kg on mice model of wt. 20-25 g (n=10).<sup>42</sup>

**CORRECTIVE (MUSLIH):** *Sharbate-e Anar* and *anisoon* (*Pimpinella anisum*).<sup>8, 20</sup>

**ALTERNATIVE (BADAL):** *Gafis* (*Gentiana olivieri*), *halela zard* (*Teminalia chebula*),<sup>28</sup> *jaada*, *shaekh armani*.<sup>14, 19</sup>

**IMPORTANT FORMULATIONS IN UNANI MEDICINE:** *Itrifal-e-Didan*, *Arq Afsanteen*,<sup>15</sup> *Joshanda afsanteen*, *Qurs Afsanteen*,<sup>17</sup> *Arq baraye warme jigar*, *Zimad kabit*, *Roghan-e-kala*, *Qurs-e-Aelaoos* etc.<sup>10</sup>

**CONCLUSION**

Aerial parts of *Artemisia absinthium* (afsanteen) such flower, seeds, fruit, leaves, stems and twigs. are most commonly used for medicinal purposes in Unani system of medicine. Pharmacological studies provided evidence of its potential hepatoprotective, immunomodulator, antioxidant, anti-inflammatory, antipyretic, analgesic, antidepressant, neuroprotective, antifungal, antibacterial, appetizer activities justifying its traditional usage in jaundice, hepatitis, cirrhosis, hepatobiliary obstruction, cirrhosis, general weakness, fevers, gouty and rheumatic pain, depression, tremor, paralysis, infections, gastritis, indigestion, anorexia etc. in Unani and ethnobotanical literature.

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**AUTHORS CONTRIBUTION**

Dr. S Ansari collected, analysed and drafted the data and did final review of the manuscript. Prof. Y Shamshi did proofreading of the whole manuscript. Dr. QA Khan did final review of the manuscript.

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