

Available online on 15.09.2022 at <http://jddtonline.info>

# Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Copyright © 2022 The Author(s): This is an open-access article distributed under the terms of the CC BY-NC 4.0 which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited



Open Access Full Text Article



Review Article

## Saqmunia (*Convolvulus scammonia* L.), an important drug used in Unani system of medicine: A review

Huzaifa Ansari<sup>1</sup>, Athar Parvez Ansari<sup>2\*</sup>, Ifra Qayoom<sup>1</sup>, Bazilah Majeed Reshi<sup>1</sup>, Abdul Hasib<sup>1</sup>, N Zaheer Ahmed<sup>2</sup>, Noman Anwar<sup>2</sup>

<sup>1</sup> Regional Research Institute of Unani Medicine, Srinagar (NABH Accredited), Central Council for Research in Unani Medicine, Ministry of Ayush, Govt. of India

<sup>2</sup> Regional Research Institute of Unani Medicine, Chennai (NABH Accredited), Central Council for Research in Unani Medicine, Ministry of Ayush, Govt. of India

### Article Info:



#### Article History:

Received 19 July 2022  
Reviewed 04 Sep 2022  
Accepted 11 Sep 2022  
Published 15 Sep 2022

### Cite this article as:

Ansari H, Ansari AP, Qayoom I, Reshi BM, Hasib A, Ahmed NZ, Anwar N, Saqmunia (*Convolvulus scammonia* L.), an important drug used in Unani system of medicine: A review, Journal of Drug Delivery and Therapeutics. 2022; 12(5):231-238

DOI: <http://dx.doi.org/10.22270/jddt.v12i5.5681>

### \*Address for Correspondence:

Athar Parvez Ansari, Regional Research Institute of Unani Medicine, No. 1, West Madha Church Road, Royapuram, Chennai, Tamil Nadu, India, 190006

### Abstract

**Background:** *Saqmunia*, a resin obtained from the root of *Convolvulus scammonia* L. is widely used in Unani system of medicine for the treatment of several body ailments. This important medicinal plant belongs to Convolvulaceae family, and is commonly grown in Mediterranean regions.

**Purpose of the review:** The core objective of this appraisal is to emphasize the different characteristics of *Saqmunia* (*Convolvulus scammonia* L.) viz. botanical description, pharmacological and therapeutic properties, folklore uses, temperament, dose, scientific studies, etc, as mentioned in Unani and botanical literature which will enable in the rationale use of this botanical drug.

**Materials and methods:** This review was undertaken with exhaustive literature survey of Unani and botanical texts, and published articles related to *Saqmunia* (*Convolvulus scammonia* L.). The botanical names of drugs mentioned in this review have been validated through 'World Flora' (<http://www.worldfloraonline.org>).

**Results:** The Unani physicians prescribe *Saqmunia* for the treatment of skin diseases, chronic headache, bilious fever, conjunctivitis, jaundice, etc. This drug is also added in many compound Unani formulations such as *Habb-i-Kotwali*, *Safoof-i-Suranjan*, *Habb-i-Banafsha*, *Ayarij-i-Kabir*, *Tiryaaq-i-Zahab*, *Habb-i-Saqmunia*, *Majun-i-Anjeer*, etc which are used for various therapeutic purposes. The phytochemical analysis of the root of *Convolvulus scammonia* L. reported that it contains 8% resin along with beta-methyl-esculetin, dihydroxy cinnamic acid, ipuranol, sucrose, reducing sugar, starch, etc. The resin yields glycosides mainly scammonin which is pharmacologically active. Some scientific reports showed that this important medicinal plant possesses certain potential pharmacological activities. The significant anticancer property of aqueous and alkaline extracts of *Convolvulus scammonia* L. has been identified in mice.

**Conclusion:** Although, the resin of *Convolvulus scammonia* L. is extensively used in Unani medicine. But, sufficient studies regarding its pharmacognosy, phytochemistry, pharmacology and toxicology are still lacking. Hence, it is suggested that extensive studies by using modern scientific parameters may be carried out to explore multi-dimensional utility of this important botanical drug.

**Keywords:** *Saqmunia*; *Convolvulus scammonia* L.; Unani medicine; Resin

**Abbreviations:** CCRUM: Central Council for Research in Unani Medicine; GC-MS: Gas Chromatography-Mass Spectroscopy; Fig: Figure; HPLC: High Performance Liquid Chromatography; HPTLC: High Performance Thin Layer Chromatography; H22: Hepato-Carcinoma Cell Line; ICP-MS: Inductively Coupled Plasma Mass Spectroscopy; LC-MS: Liquid chromatography-Mass Spectroscopy; pH: Power of Hydrogen ion; WHO: World Health Organization.

## 1. INTRODUCTION:

*Convolvulus scammonia* L. belongs to Convolvulaceae family which is also referred as morning glory family of flowering plants. This family describes around 55 genera and 1650 species of plants. Most of the plants belonging to this family are categorized as annual or perennial herbs having twining stems. Some species are classified as shrubs and trees. *Convolvulus scammonia* L. belongs to *Convolvulus* genus in which approximately 250 species are discussed.<sup>1</sup> The plants of this genus are usually found growing in tropical and temperate regions of the world. The taste of most of the plants

is acrid, and they contain a milky juice whose action is usually purgation. Such milky fluid is classified as resin which yields certain glucosides such as convolvulin, jalapin, scammonin, etc.<sup>2</sup> In Unani medicine, the resin of *Convolvulus scammonia* L. by the name of *Saqmunia* is described in various classical literature such as Al-Jame al-Mufredat al-Adwiya al-Aghzia of Ibn al-Betar,<sup>3</sup> Al-Qanoon fi al-Tib of Ibn Sina,<sup>4</sup> Kitab al-Hawi of Razi (865-925 AD),<sup>33</sup> Muheeta-i-Azam of Azam Khan,<sup>5</sup> Khazain al-Adwiya of Najmul Ghani Khan,<sup>6</sup> etc. *Convolvulus scammonia* L. is a perennial herb whose root is fleshy and fusiform. This medicinal plant is usually grown in the Mediterranean region.<sup>7</sup> *Saqmunia* is considered as poisonous and toxic drug hence it is

medicinally used after detoxification in Unani medicine.<sup>4-6,8,9</sup> It is usually prescribed as purgative for the purpose of evacuation of morbid humours particularly *ṣafrāwī mādda* (bilious humour) from the body which is dominant in several ailments.<sup>5,8,10,11,33</sup> It is also used for the treatment of *bahaq* (pityriasis), *baraṣ* (vitiligo), *kalaf* (melasma/ cholasma), *jarab* (scabies), *qūbā* (ringworm/ dermatophytosis), *huṣr* (constipation), *istisqā'* (ascites), *waja' al-mafaṣil* (joints pain), etc.<sup>5</sup> According to Unani physicians, this drug produces many adverse effects such as restlessness, depression, palpitation, nausea, loss of appetite, increased thirst, etc. It has also been observed that it may produce some serious noxious effects particularly related to heart, stomach and liver.

Nonetheless, the detailed description of *Saqmunia* (*Convolvulus scammonia* L.) regarding its morphology, temperament, pharmacological properties, medicinal uses, dose, compound formulations, etc are extensively discussed in the literature of Unani and other traditional medicines but adequate information on its pharmacognosy, standardization, phytochemistry, quality control, therapeutic validation, pharmacokinetic profile, toxicity studies, etc are not available. The main objective of the present review is to explore varied aspects of *Saqmunia* (*Convolvulus scammonia* L.) as described in Unani and other literature which will ultimately encourage the researchers of Unani and other disciplines to carry out more scientific studies for further exploration.

## 2. MATERIALS AND METHODS:

On the basis of major keywords selected for this review including *Saqmunia* and *Convolvulus scammonia* L., total 34 literatures comprising Unani classical texts, botanical literature and published articles available on different search engines like Science Direct, PubMed, Research Gate and Google Scholar have been referred. The Unani literature from the period of 9<sup>th</sup> to 20<sup>th</sup> Century AD were reviewed to explore the botanical description, temperament, pharmacological properties and medicinal uses, dose, side effects, substitutes, detoxification methods and compound formulations of *Saqmunia*. Four important botanical literatures of English language such as *Materia Indica* of Ainslie, *Indian Medicinal Plants* of Kirtikar and Basu, *Trease and Evans Pharmacognosy*, and *Indian Medicinal Plants* of Khare were also referred in the present review. The published articles from the period of 1990 to 2021 AD pertaining to botanical description, pharmacognosy, chemical constituents, pharmacological actions, etc of *Convolvulus scammonia* L. were also reviewed. (Table 1) The botanical names of medicinal plants cited in this article were validated through 'World Flora' (<http://www.worldfloraonline.org>).<sup>12</sup> The appropriate English translations of various Unani terminologies mentioned in this manuscript were used after referring the Standard Unani Medical Terminology published by the CCRUM in collaboration with the WHO.<sup>11</sup>

**Table 1: List of reviewed literature:**

Types of literature	Title/ Source	Authors
Unani classical Literature <b>Keywords:</b> Botanical description, Temperament, Pharmacological properties, Medicinal uses, Dose, Side effects, Substitute, Detoxification methods, Compound formulations (n = 20)	Kitab al-Hawi	Zakaria Razi (865-925 AD)
	Al-Qanoon fi al-Tib	Ibn Sina (980-1037 AD)
	Al-Jame al-Mufredat al-Adwiyava al-Aghzia	Ibn al-Betar (1197-1248 AD)
	Muheet-i-Azam	Mohammad Azam Khan (1722-1807 AD)
	Qarabadeen-i-Azam va Akmal	Mohammad Azam Khan (1722-1807 AD)
	Khazain al-Adwiya	Najmul Ghani Khan (b. 1859 AD)
	Ilm al-Adwiya Nafeesi	Mohammad Kabiruddin (1889-1976 AD)
	Makhzan al-Mufredat	Mohammad Kabiruddin (1889-1976 AD)
	Al-Qarabadeen	Mohammad Kabiruddin (1889-1976 AD)
	Bustan al-Mufredat	Abdul Hakim M
	Taj al-Mufradat	Tarique
	Mufredat-i-Azizi	Abdul Haleem
	National Formulary of Unani Medicine, Part II, III, IV	Anonymous (Published by Dept. of Ayush, Ministry of H & FW, Govt. of India)
Hamdard Pharmacopoeia of Eastern Medicine	Mohammad Said (1920-1998 AD)	

	Qarabadeen-i-Jadeed	Abdul Hafeez
	Makhzan al-Murakkabat	Ghulam Jilani Khan
	Text Book of Single Drugs	Abdul Wadud
	Standard Unani Medical terminology	Anonymous (Published by Dept. of Ayush, Ministry of H & FW, Govt. of India)
Botanical Literature	Materia Indica	W. Ainsle
<b>Keywords:</b>	Indian Medicinal Plants	C. P. Khare
Taxonomy, Botanical description, Pharmacological actions, Habitat (n = 4)	Trease and Evans Pharmacognosy	W. C. Evans
	Indian medicinal plants	K. R. Kirtikar and B. D. Basu
Published articles	PubMed, Science Direct, Research Gate and Google Scholar	
<b>Keywords:</b> Botanical description, Morphology, Pharmacognosy, Toxicology, Phytochemistry, Pharmacological actions (n = 10)		

### 3. RESULTS:

#### 3.1 Scientific classification:

Kingdom:	Plantae
Subkingdom:	Viridiplantae
Superdivision:	Embryophyta
Division:	Tracheophytes
Subdivision:	Spermatophytina
Class:	Magnoliopsida
Superorder:	Asteranae
Order:	Solanales
Family:	Convolvaceae
Genus:	Convolvulus
Species:	<i>Convolvulus scammonia</i> L. <sup>13</sup>

#### 3.2 Mutradifat (Vernacular name):

**Arabic:** *Sigmonia*, *Mahmoda*, *Helablab*; **English:** *Scammony*, *Syrian bind weed*, *Purging bind weed*; **French:** *Scamnonee*; **German:** *Kleinasiatische Winde*; **Hindi:** *Sakmunia*; **Spanish:** *Escamonia*; **Swedish:** *Hartsvinda*.

#### 3.3 Botanical description:

*Convolvulus scammonia* L. is categorized as perennial herb which has fleshy and fusiform root.<sup>14</sup> The height of its twining stem is around 2 m.<sup>34</sup> The root has several branches towards the lower end with greyish in color and possesses acrid-milky juice. The stem is annual, numerous, slender, round, smooth, branched, twining, very slightly angular near the end. The

leaves are arranged on long petioles, alternate, sagittate, oblong, acute, entire, quite smooth, truncate and angular at the base, spreading lobes with bright green color. The flowers are found on axillary, solitary, 3-flowered, peduncles, scarcely twice as long as the leaves. Sepals are 5 in number, rather lax, smooth, ovate, obtuse, and having a point along with covered at the edge. (Fig 1) Corolla is funnel shaped, extensively expanded and pale sulphur-yellow in color, thrice as long as the calyx, an inch or more in length; limb entire and somewhat reflex. Stamens are 5 in number, erect, converging and three times as short as a corolla. The ovary with 2 cells and 4 seeds, which support the thin stamens as long as the stamens, has 2 cylindrical stripes, straight, oblong, parallel, long, and white stigmas.<sup>14</sup> The resin is obtained from the rhizome of *Convolvulus scammonia* L.,<sup>7,14</sup> by making a transverse or oblique incision.<sup>14</sup>

In Unani medicine, this plant origin drug is used for various therapeutic purposes.<sup>8</sup> Ibn Sina (980-1037 AD) has mentioned that it is an exudate of a plant which is found growing as vegetation.<sup>4</sup> Its branches grow from the root and spread out on the land. The length of each branch is around 3-4 feet. The resinous material secretes from the branches of root when they are getting abraded or touched by hand. The morphological features of the leaf of *Saqmunia* resembles to the leaf of *Aftimoon* (*Cuscuta reflexa* Roxb.) with more soft, thin and dark green in color. The flower is white, round and hollow in shape, with acrid taste and has a particular smell. In Unani medicine, usually the resin obtained from the root (rhizome) of *Convolvulus scammonia* L. is medicinally used. (Fig 2) Some Unani scholars have mentioned that its color may be khaki, grayish-black and bluish-yellow.<sup>8</sup>

Fig 1: Leaf & Flower of *Convolvulus scammonia* L.Fig 2: *Saqmunia* (Resin)

### 3.4 Methods for collection of resin:

Usually, two methods for collection of resinous material from the branches of root (rhizome) of *Saqmunia* are being preferred. (i) Dioscorides (64 AD) stated that a shallow pit should be made in the ground near the root of the plant. The leaves of the plant should spread over the pit and an incision should be made in the branches of the root. The secreted resinous material is accumulated over the leaves; (ii) A shallow pit is made in the ground near the root of the plant wherein sea shells are placed. The incision is made in the bark of branches of the root from which the exudates are collected in the sea shell.<sup>5</sup>

### 3.5 Mizāj (Temperament):

The temperament of *Saqmunia* is described as Hot in 3<sup>rd</sup> & Dry in 2<sup>nd</sup> stage<sup>5,6,9</sup> or Hot & Dry in 3<sup>rd</sup> degree.<sup>4,5,8</sup>

### 3.6 Af'al (Pharmacological actions):

The pharmacological actions of *Saqmunia* are *jālī* (detergent), *muḥallīl* (resolvent), *mushil-i-ṣafrā* (cholagogue), *mukhrij-i-Janīn-o-mashīma* (abortifacient), *mukhrij-i-dīdān-i-am'ā'* (vermifuge/ anthelmintic),<sup>5,9</sup> *mufattiḥ* (deobstruent),<sup>5</sup> *mudirr-i-fuḍlāt* (excretion of waste products), *mudirr-i-bawl* (diuretic),<sup>4</sup> *tiryāq* (antidote),<sup>4,5,9</sup> *muṣaffi-i-dam* (blood purifier),<sup>15</sup> *muḥarriq* (stimulant),<sup>4</sup> hydragogue, cathartic, etc.<sup>7</sup>

### 3.7 Istemalat (Therapeutic uses):

In Unani medicine, *Saqmunia* is used for the treatment of several ailments like *bahaq* (pityriasis), *baraṣ* (vitiligo), *namash* (naevus), *kalaf* (melasma/ cholasma), *jarab* (scabies), *qūbā* (ringworm/ dermatophytosis), *huṣr* (constipation), *istisqā'* (ascites), *waja' al-mafaṣīl* (joints pain), *suda' muzmin* (chronic headache), *humma al-ghib* (bilious fever), *āshob-i-chashm* (conjunctivitis), *yarqan* (jaundice), etc.

The Unani physicians prescribe *Saqmunia* as stand alone or along with other drugs in combination for local application and internal use both. In cases of vitiligo, pityriasis, naevus and melasma, the *tilā'* (liniment) prepared with the root of *Saqmunia* is applied over the affected parts. The paste prepared with *Saqmunia* and honey is externally applied over non-healing wounds. In case of arthritis, the paste prepared with *Saqmunia* (1 part), barley flour (1/2 part) and vinegar is locally applied over the affected joints. The mixture prepared with *Saqmunia* and *Gul-i-Surkh* (*Rosa damascena* Mill. flower) is locally applied over the forehead in case of headache. Ibn Sina advised that 3.5 g of the root of *Saqmunia* along with *Mā'*

*al-'Asal* (Honey water) or plain water is useful for evacuation of *balghami* (phlegmatic) or *ṣafrāwī* (bilious) substances from the body.<sup>5</sup>

### 3.8 Miqdār Khurak (Therapeutic dose):

According to Unani literature, the therapeutic dose of non-detoxified *Saqmunia* is 1.5-9 *ratti* (187.5- 1125 mg) whereas the dose of detoxified *Saqmunia* is 6-12 *ratti* (750-1500 mg).<sup>6</sup>

### 3.9 Muḍir va Muṣliḥ (Adverse effects and Correctives):

The Unani physicians observed that *Saqmunia* may be harmful for stomach,<sup>5,33</sup> intestine,<sup>5</sup> liver<sup>5,33</sup> and heart. The higher dose of *Saqmunia* may produce nausea, vomiting, abdominal pain, and cramps, syncope, irritability, anorexia, etc.<sup>5</sup>

In case if adverse effects are produced by *Saqmunia*, certain drugs such as *Gul-i-Surkh* (*Rosa damascena* Mill.),<sup>6,16</sup> *Sikanjabeen*, *Nishasta* (starch), *Kateera* (*Sterculia urens* Roxb.), *Mastagi* (*Pistacia lentiscus* L.),<sup>6</sup> *Kundur* (*Boswellia serrata* Roxb.), *Anisoon* (*Pimpinella anisum* L.),<sup>5,6</sup> *Behi* (*Cydonia oblonga* Mill.), *Ayarij Feeqra*, etc may be used to control it.<sup>5</sup>

### 3.10 Authentication:

The Unani scholars have mentioned certain observational methods for authentication of the best quality of *Saqmunia*. For instance, *Saqmunia* which appears as sea shell with yellowish-white color is considered as best quality. Moreover, the good quality of *Saqmunia* does not produce corrosive effects while chewing, and is easily dissolved in water and alcohol. The adulterated and poor quality of *Saqmunia* comes in different colors like bright-green and black with smooth edge and is easily broken into irregular pieces.<sup>5,6</sup>

### 3.11 Shelf life:

According to observational studies of Unani physicians, the shelf life of roasted and non-roasted *Saqmunia* is 2 and 3 years, respectively.<sup>6</sup>

### 3.12 Badal (Therapeutic interchange/ Substitute):

When *Saqmunia* is not available, it is advised that *Ailwa* (*Aloe vera* (L.) Burm. f.) or *Halela Zard* (*Terminalia chebula* Retz.) may be used as its substitute according to the indication.<sup>17,18</sup>

### 3.13 Methods of detoxification of *Saqmunia* (*Convolvulus scammonia* L.):

The Unani physicians asserted that *Saqmunia* (*Convolvulus scammonia* L.) should be therapeutically used after detoxification or purification for which many methods are

described in Unani literature but the commonly preferred method is 'amal-i-tashwiya (roasting)<sup>3-6,8,19</sup>

**3.13.1 Tashwiya (roasting):** Under this method, *Saqmunia* (*Convolvulus scammonia* L.), apple or quince fruit and cow's dung cakes are taken. A hollow space is made in the apple or quince fruit wherein *Saqmunia* (*Convolvulus scammonia* L.) is placed that is further covered with the piece of apple and paste of flour. Thereafter, the apple or quince fruit is placed into moderate heat of cow's dung cakes till the color of flour gets brownish. At last, the drug is removed from the apple or quince fruit which is considered as *Saqmunia mudabbar*.

3.13.2 *Saqmunia* (*Convolvulus scammonia* L.), is packed in a muslin cloth that is further placed into a hollow space of an apple followed by it is covered by applying the paste of wheat flour, and the apple is got heated in the ash.

3.13.3 *Saqmunia* (*Convolvulus scammonia* L.) along with the powder of *Tukhm-i-Karafs* (*Apium graveolens* L. seeds) is grounded in the apple juice.

3.13.4 Habish Ibn Hasan and Razi avowed that *Saqmunia* (*Convolvulus scammonia* L.) is kept in a hollow space of apple

that is further packed using wheat dough. The apple is roasted and the drug is removed from it. *Anisoon* (*Pimpinella anisum* L.) and *Duqu* (*Peucedanum grande* C.B Clarke) are mixed with *Saqmunia* which is further fried in *Roghan-i-Badam* (oil of *Prunus amygdalus* Batsch).

3.13.5 *Saqmunia* (*Convolvulus scammonia* L.) and *Mastagi* (*Pistacia lentiscus* L.) are pounded together and packed it in a cloth bag followed by it is kept into a hollow space of an apple that is further packed using wheat dough, and is roasted.

3.13.6 The roasted *Saqmunia* is used along with *Rubb-us-Soos* (dried root extract of *Glycyrrhiza glabra* L.) and *Kateera* (*Sterculia urens* Roxb.).

3.13.7 *Saqmunia* is grounded in 'Arq-i-Gulab (Rose water) or *Āab-i-Behi* (Quince fruit juice) or *Āb-i-Seb* (Apple juice) and pills are prepared.<sup>5,6</sup>

### 3.14 Murakkabat (Compound preparations):

*Saqmunia* (*Convolvulus scammonia* L.) is added as one of the ingredients in several compound preparations which are used for different therapeutic purposes. (Table 2).

**Table 2: Compound preparations containing *Saqmunia* (*Convolvulus scammonia* L.)**

Compound preparations	Pharmacological actions/ Therapeutic uses	Ref
<i>Ayarij-i-Arkaganees</i>	'Irq al-Nasā (sciatica), Gazīdgī (dog bite), Qūbā (ring worm), Kharish (itching)	21
<i>Ayarij-i-Barid</i>	Şudā' (headache), Sadr-o-Duwār (vertigo and giddiness), Āshob-i-Chashm (conjunctivitis), Waja' al-Asnān (odontalgia), Waja' al-Udhun (otalgia)	21
<i>Ayarij-i-Kabeer</i>	Tanqiya-i-Dimagh (evacuation of morbid matters from brain)	21,22
<i>Habb-i- Kotwali</i>	Laqwa (facial paralysis), Fālij (paralysis), Dā'al-Tha'lab (alopecia areata)	23
<i>Habb-i-Aafiat</i>	Waja' al Mafāşil (joints pain), Laqwa (facial paralysis), Fālij (paralysis), Şudā' (headache), Shaqīqa (migraine)	23
<i>Habb-i-Banafsha</i>	Nazla-o-Zukām (catarrh), Dīq al-Nafas (bronchial asthma)	24
<i>Habb-i-Barmak</i>	Şudā' (headache), Shaqīqa (migraine), Ĥurqa al-Ain (burning eye), Nazla-o-Zukām (catarrh)	23
<i>Habb-i-Dawali</i>	Dawālī (varicose veins.), Dā' al-Fīl (filariasis)	25
<i>Habb-i-Jahat</i>	Tanqiya-i-Dimagh (evacuation of morbid matters from brain), Amraq-i-Chashm (eye diseases)	22
<i>Habb-i-Kheezaran</i>	Khanāzir (lymphadenitis)	23
<i>Habb-i-Lajward</i>	Munaqqi-i-sar-o-badan (evacuation of morbid matters from head and body)	22
<i>Habb-i-Naf' Subat va-Subat Sahri</i>	Subāt (coma), Subāt sahrī (coma vigil)	22
<i>Habb-i-Narmushk</i>	Qūlanj (colic), Maghş (tenesmus), Waja' al-Mi'da (gastralgia)	26
<i>Habb-i-Qoqaya</i>	Tanqiya-i-Dimagh (evacuation of morbid matters from brain), Amraq-i-Dimagh (diseases of brain)	22
<i>Habb-i-Saqmunia</i>	Mulayyin-i-Am'ā' (laxative)	24
<i>Habb-i-Zahab</i>	Şudā' (headache), Dard-i-Chashm (eye pain)	22
<i>Itrifal Mulayyan</i>	Şudā' (headache), Waja' al-Udhun (earache)	21,27
<i>Itrifal Mulayyan M'lūm</i>	Qulanj (colic), Ĥusr (constipation), Şudā' (headache), Waja' al-Udhun (earache)	21,22
<i>Itrifal Zamani</i>	Qulanj (colic), Ĥusr (constipation), Şudā' (headache), Mālankhūliya Marāqī (psychoneurosis)	22,27
<i>Itrifal Zamani Mulayyin</i>	Mālankhūliya Marāqī (psychoneurosis), Nazla-o-Zukām (catarrh)	15
<i>Itrifal Mushil</i>	Bahaq (pityriasis), Bars (leucoderma), Judham (leprosy), Dā' al-Fīl (filariasis)	26
<i>Jawarish-i-Ood-i-Mulayyin</i>	Mulayyin-i-Am'ā' (laxative)	26
<i>Jawarish-i-Ood-i-Mushil</i>	Mulayyin-i-Am'ā' (laxative)	21

<i>Jawarish-i-Safarjali Mushil</i>	<i>Dāfi'-i-Qūlanj</i> (anticolic), <i>Dāfi'-i-Qābiḍ-i-Am'ā'</i> (antiastriquent), <i>Muqawwī-i-Mi'da</i> (stomachic).	21,22,26
<i>Jawarish-i-Shaher Yaran</i>	<i>Muqawwī-i-Mi'da</i> (stomachic), <i>Buṭlān al-Ishtihā'</i> (anorexia), <i>Dāfi'-i-Qūlanj</i> (anticolic)	21,22,24
<i>Jawarish-i-Tabasheer Mushil</i>	<i>Mulayyin-i-Am'ā'</i> (laxative)	22
<i>Jawarish-i-Usqaf</i>	<i>Qūlanj</i> (colic), <i>Mushil</i> (purgative)	22
<i>Jawarish-i-Zanjabil</i>	<i>Qābiḍ</i> (astringent), <i>Hāḍim</i> (digestive)	22
<i>Majun Anjir</i>	<i>Ḥuṣr</i> (constipation), <i>Mulayyin-i-Am'ā'</i> (laxative)	24
<i>Majun Sakbinaj</i>	<i>Qūlanj</i> (colic)	28
<i>Majun Saqmunia</i>	<i>Īla'ūs</i> (intestinal obstruction), <i>Qūlanj</i> (colic)	28
<i>Majun Suranjan</i>	<i>Ḥudār</i> (antirheumatic), <i>Waja' al Mafāṣil</i> (joints pain)	24
<i>Majun Talkh</i>	<i>Laqwa</i> (facial paralysis), <i>Fālij</i> (paralysis), <i>Muqawwī-i-Mi'da</i> (stomachic), <i>Musakkin-i-Alam</i> (analgesic)	24
<i>Qurs-i-Mulayyan</i>	<i>Ishāl</i> (diarrhea), <i>Mulayyin-i-Am'ā'</i> (laxative)	24
<i>Qurs-i-Didān</i>	<i>Qātil-i-Didān</i> (anthelmintic)	24
<i>Qurs-i-Mushil</i>	<i>Mulayyin-i-Am'ā'</i> (laxative), <i>Mushil-i-Ṣafrā'</i> (cholagogue)	24
<i>Sabadaritūs Akbar</i>	<i>Laqwa</i> (facial paralysis), <i>Fālij</i> (paralysis), <i>Ṣudā'</i> (headache), <i>Ra'sha</i> (tremor)	22
<i>Safūf-i-Suranjan</i>	<i>Waja' al Mafāṣil</i> (joints pain)	24
<i>Tiryāq-i-Zahab</i>	<i>Mālankhūliya Marāqī</i> (psychoneurosis), <i>Ṣar'</i> (epilepsy), <i>Judhām</i> (leprosy), <i>Istisqā' Ziqqī</i> (ascites), <i>Yaraqān</i> (jaundice)	22

### 3.15 Chemical constituents:

The root of *Convolvulus scammonia* L. yields approximately 8% resin along with beta-methyl-esculetin, dihydroxy cinnamic acid, ipuranol, sucrose, reducing sugar, starch, etc. The resin contains glycosides and methylpentosides of jalapinic acid and its methyl ester. An ether-soluble resin glycoside namely jalapin has been isolated from the root of scammony. The scammonic acid A is obtained through alkaline hydrolysis. Furthermore, ether-soluble resin glycosides viz. scammonin I, II, III, IV, V, VI, VII and VIII have been isolated from the root of scammony. The ether soluble extracts of the resin contain glucose and hydroxyl fatty acid. It also contains seven organic acids such as acetic, propionic, isobutyric, isovaleric, 2-methylbutyric, n-valeric and tiglic acids, and two hydroxyl fatty acids viz. ipurolic and rhamnose. In addition, ether soluble resin i.e. jalapin yields same organic acids and monosaccharides, a type of hydroxyfatty acids including jalapinic acid. The jalapin was treated sequentially with sephadex LH-20 and silica gel column chromatography. The final purification provides two pure genuine glycosides such as scammonin I (C50H84O21), and II (C45H78O19) in which scammonin I was the major resin glycoside and obtained in a yield of 56.9% from the total resin glycoside.<sup>14,29</sup>

### 3.16 Scientific studies:

#### 3.16.1 Anticancer activity:

Hadi et al, 2011 evaluated the anticancer effects of aqueous and alkaline raw extracts of *Convolvulus scammonia* L. on mitosis and cancer cells in mice. The inhibitory effects of crude aqueous extract of *Convolvulus scammonia* L. was compared with crude alkaloidal extract on bone marrow cells multiplication in mice at the dose levels of 10, 20, 40, 80 and 160 mg/ kg b. w. The inhibitory effects of each extract were also compared with colchicine. The crude alkaloid extract showed significant arresting percentage of metaphase compared to the aqueous extract at small dose levels whereas the high dose level of both extracts showed 70% inhibitory effects. The study also reported that both extracts were found to be active in reducing tumor size in a dose dependent

manner.<sup>30</sup> The apoptotic activity of crude alkaloidal extract obtained from the leaves of *Convolvulus scammonia* L. was investigated against mice hepato-carcinoma cell line (H22). The result revealed that the test drug at the concentration of 1 mg/ kg b. w. significantly inhibited H22 cell line tumor growth after three weeks of the treatment.<sup>31</sup>

#### 3.16.2 Cytotoxic effect:

Somayah Esmaeili et al, 2015 has reported that the extract of *Convolvulus scammonia* L. possess significant cytotoxic activity on Madin-Darby bovine kidney cells.<sup>32</sup>

## 4. DISCUSSION:

The resin namely *Saqmunia* obtained from the root (rhizome) of *Convolvulus scammonia* L. is illustrated in many Unani classical literatures due to its diverse pharmacological properties. *Convolvulus scammonia* L. belongs to *Convolvulus* genus in which around 250 species of plants are discussed.<sup>1</sup> The plants belonging to this genus including *Convolvulus scammonia* L. are usually found growing in tropical and temperate regions of the globe. According to Unani pharmacology, the mechanism of action of any drug is chiefly based on its temperament. The treatment of diseases is based on the principle of *ilaj bi'l zid* (heteropathy) wherein drugs act against the contrasting temperament of the diseases thus modifying the pathological states and restores humoral equilibrium.<sup>20</sup> Since, the temperament of *Saqmunia* (*Convolvulus scammonia* L.) is hot and dry thus it is used as *muhallil* (resolvent),<sup>5,9</sup> *mufattiḥ* (deobstruent),<sup>5</sup> *jāli* (detergent), *mushil-i-safrā* (cholagogue), *mukhrij-i-janīn-omashīma* (abortifacient), *mukhrij-i-didān-i-am'ā'* (vermifuge/anthelmintic),<sup>5,9</sup> *mudirr-i-bawl* (diuretic),<sup>4</sup> *tiryāq* (antidote),<sup>4,5</sup> *muṣaffi-i-dam* (blood purifier),<sup>15</sup> etc for the treatment of many diseases such as *bahaq* (pityriasis), *baraṣ* (vitiligo), *namash* (naevus), *kalaf* (melasma/ cholasma), *jarab* (scabies), *qūbā* (ringworm), etc. The main pharmacological activity of *Saqmunia* (*Convolvulus scammonia* L.) is purgation hence it is also used in the treatment of *istisqā'* (ascites), *waja' al-mafāṣil* (joints pain), *sudā' muzmin* (chronic headache), *humma al-ghibb* (bilious fever), *āshob-i-chashm*

(conjunctivitis) and *yarqan* (jaundice).<sup>5</sup> In Unani medicine, it is believed that the morbid matters found in the above mentioned diseases are excreted from the body through purgation. This drug is also added in several Unani compound formulations which are used for the treatment of various ailments. *Tiryaq-i-Zahab* is used for the treatment of *mālankhūliya marāqī* (psychoneurosis), *sar'* (epilepsy), *judhām* (leprosy), *istisqā' ziqqī* (ascites) and *yaraqān* (jaundice).<sup>22</sup> *Qurs-i-Didān* is prescribed in cases of *didān-i-āma'* (intestinal worms) whereas *Safūf-i-Suranjan* is given in the treatment of *waja' al mafāsil* (joints pain).<sup>24</sup> The phytochemical analysis of *Saqmunia* (*Convolvulus scammonia* L.) revealed that its different parts contain many important biologically active compounds including scammonin which possesses some pharmacological activities. Some scientific studies revealed that this important drug has potential in the treatment of certain diseases including cancer.

It is estimated that around 80% population throughout the world depends on traditional medicines for the management of several ailments. The standardization and quality control studies of herbal drugs ensure their quality and purity. The quality of any drug may be poor due to several factors which ultimately affect its therapeutic potential. In this regard, different parameters such as moisture content, ash value, pH, extractive values, microbial load, heavy metals, pesticides residue, etc should be evaluated in any herbal drugs.<sup>20</sup> Due to lack of data, the present review suggested that the pharmacognostical studies of *Saqmunia* (*Convolvulus scammonia* L.) may be carried out through organoleptic and microscopic evaluation. In addition, physicochemical standardization and quality control studies of this useful drug may also be carried out. Since, secondary metabolites of plant materials such as alkaloids, glycosides, flavonoids, saponins, tannins, etc are important to know the pharmacological effects<sup>20</sup> thus the detailed qualitative and quantitative phytochemical evaluation of *Saqmunia* (*Convolvulus scammonia* L.) may be studied using Ultraviolet and Infrared Spectroscopy, High Performance Thin Layer Chromatography (HPTLC), High Performance Liquid Chromatography (HPLC), Liquid Chromatography-Mass Spectroscopy (LC-MS), Gas Chromatography-Mass Spectroscopy (GC-MS), Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS), etc for further exploration. This review also found that extensive pharmacological studies of *Saqmunia* (*Convolvulus scammonia* L.) have not yet been carried out to evaluate its efficacy as claimed by Unani and other traditional healers. Hence, it is suggested that different therapeutic profile of this important herb may be evaluated through *in-vitro*, pre-clinical and clinical trials. Furthermore, it is also recommended that the safety profile of crude and detoxified samples of *Saqmunia* (*Convolvulus scammonia* L.) may also be checked in animal models so that the claim of Unani scholars may be validated on the basis of today's modern parameters.

## 5. CONCLUSION:

After perusing through several Unani and other literature, it has been found that *Saqmunia* (*Convolvulus scammonia* L.) is widely used in Unani and other traditional systems of medicine for the treatment of many diseases. Apart from its pharmacological activities, the Unani medicine also discussed other aspects of this plant drug such as botanical description, temperament, authentication of good and bad quality, method of detoxification, shelf-life, adverse effects and their correctives, substitutes, therapeutic dose, compound preparations, etc. Only limited information regarding pharmacognostical evaluation, physicochemical standardization, quality control studies, phytochemical analysis, pharmacological activities and toxicological studies of this drug is available in the public domain which warrants it

necessity that these studies may be carried out on scientific lines for understanding its enormous benefits deeply.

## Funding Source:

This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Conflict of interest:

All the authors have confirmed that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

## REFERENCES:

1. Evans WC. Trease and Evans Pharmacognosy, 16th ed. Toronto: Elsevier; 2009: p. 37.
2. Kirtikar KR, Basu BD. Indian medicinal plants, 2nd revised Ed. Delhi: Periodical expert book agency. 2012: p. 1734.
3. Betar I. Al-Jam' al-Mufredat al-Adwiya val-Aghziya, 3rd vol. (Urdu translation by Central Council for Research in Unani Medicine). New Delhi: Dept. AYUSH, Ministry of H & FW, Govt. of India; 1999: p. 51-54.
4. Sina I. Al Qanoon fi al-Tib (Urdu translation by Kanturi GH), 2nd vol. New Delhi: Aijaz Publishing House; 2010: p. 408-409.
5. Khan A. Muheet-i-Azam, 3rd vol. (Urdu translation by Central Council for Research in Unani Medicine). New Delhi: Dept. of AYUSH, Ministry of H & FW, Govt. of India; 2014: p. 84, 105-110.
6. Khan NG. Khazain al-Adwiya, 4th vol. (Urdu translation by Central Council for Research in Unani Medicine). New Delhi: Dept. of AYUSH, Ministry of H & FW, Govt. of India; 2010: p. 370-374.
7. Khare CP. Indian Medicinal Plants: New York: Springer Science + Business Media, LLC; 2007: p. 170. <https://doi.org/10.1007/978-0-387-70638-2>
8. Kabiruddin M. Ilm al-Adwiya Nafeesi. New Delhi: Aijaz Publishing House; 2007: p. 159-161.
9. Hakim AM. Bustan al-Mufredat. New Delhi: IdaraKitab al-Shifa; 2014: p. 197.
10. Ainsle W. Materia Indica, 1st vol. London: 1826: p. 386-389.
11. Anonymous. Standard Unani Medical Terminology. New Delhi: CCRUM, Dept. of AYUSH, Ministry of H & FW, Govt. of India. 2012: p. 39, 41, 134-138, 144, 221.
12. World Flora Online. Version [2021]. [01]. Available from: <http://www.worldfloraonline.org>. [accessed 31 Jan 2022].
13. Anonymous. Integrated Taxonomic Information System (ITIS) online database. [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=506015#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=506015#null). [assessed 27 Dec 2021].
14. Al-Snafi AE. The chemical constituents and pharmacological effects of *Convolvulus arvensis* and *Convolvulus scammonia*- A review. IOSR Journal of Pharmacy. 2016; 6 (6): 64-75.
15. Tarique NA. Taj al-Mufradat. 1st ed. New Delhi: Idara Kitab al-Shifa; 2010: p. 430-440.
16. Kabiruddin M. Makhzan al-Mufredat. New Delhi: Idara Kitab al-Shifa; 2014: p. 259-260.
17. Zahid U, Kazmi MH, Siddiqui JI, Ahmad I. Saqmonia (*Convolvulus scammonia* L.), an important medicinal plant of Unani medicine: A comprehensive review. International Journal of Scientific Development and Research. 2020; 5 (10):51-56.
18. Wadud A. Text book of Single drugs. Hyderabad: Frontline Publications; 2021: p. 329-330.
19. Haleem AM. Mufredat-i-Azizi (Urdu translation by Central Council for Research in Unani Medicine). New Delhi: Dept. AYUSH, Ministry of H & FW, Govt. of India; 2009: p. 116.

20. Ansari AP, Ansari H, Butt TA, Qayoom I, Ahmed NZ, Zarawand Mudharaj (*Aristolochia rotunda* Linn.), an important medicinal plant used in Unani system of medicine: A review, *Journal of Drug Delivery and Therapeutics*. 2021; 11(6):272-280. <https://doi.org/10.22270/jddt.v11i6.5072>
21. Kabeeruddin M. Al-Qarabadeen. 2nd ed. New Delhi: Central Council for Research in Unani Medicine, Dept. of AYUSH, Ministry of H & FW. Govt. of India; 2006: p. 12, 31-32, 74, 76.
22. Khan A. Qarabadeen-i-Azam va Akmal. New Delhi: Central Council for Research in Unani Medicine, Dept. of AYUSH, Ministry of H & FW, Govt. of India; 2005: p. 2-4, 22-23, 33-34, 37.
23. Anonymous. National Formulary of Unani Medicine, Part IV. New Delhi: Dept. of AYUSH, Ministry of Health & Family Welfare, Govt. of India; 2006: p. 9, 10, 14, 17.
24. Said M. Hamdard Pharmacopoeia of Eastern Medicine. 2nd ed. Delhi: Sri Satguru Publications; 1997: p. 84-86, 96, 104, 156, 211, 218-219, 260, 263, 274.
25. Anonymous. National Formulary of Unani Medicine, Part III. New Delhi: Dept. of AYUSH, Ministry of Health & Family Welfare, Govt. of India; 2006: p. 14.
26. Anonymous. National Formulary of Unani Medicine, Part II. New Delhi: Dept. of AYUSH, Ministry of Health & Family Welfare, Govt. of India. 2006: p. 19, 93, 99, 105, 185-189, 315.
27. Hafeez A. Qarabadeen-i-Jadeed. New Delhi: Central Council for Research in Unani Medicine, Dept. of AYUSH, Ministry of H & FW, Govt. of India; 2005: p. 10, 15.
28. Khan GJ. Makhzan al-Murakkabat. New Delhi: Aijaz Publishing House; 1995: p. 352.
29. Noda N, Kogetsu H, Kawasaki T, Miyahara K. Scammonins I and II, the resin glycosides of radix scammoniae from *Convolvulus scammonia*. *Phytochemistry*. 1990; 29 (11): 3565-3569. [https://doi.org/10.1016/0031-9422\(90\)85277-M](https://doi.org/10.1016/0031-9422(90)85277-M)
30. Hade I, Zenia TA. Effect alkaloid and aqueous extraction of *Convolvulus scammonia* on microtubules of CHO cell line (China hamster). *Diyala Journal for Pure Sciences*. 2011; 7 (3):48-58.
31. Tawfeeq AT, Hassan IH, Kadhim HA, Zenia TAHD. *Convolvulus Scammonia* crude alkaloids extract induces apoptosis through microtubules destruction in mice hepatoma H22 cell line. *Iraqi Journal of Cancer and Medical Genetics*. 2012; 5 (2):134-146.
32. Esmaeili S, Ghiaee A, Naghibi F, Mosaddegh M. Antiplasmodial activity and cytotoxicity of plants used in traditional medicine of Iran for the treatment of fever. *Iranian journal of pharmaceutical research*. 2015; 14:103-107. PMID: 26185511.
33. Razi Z. *Kitab al-Hawi*, 21st vol. New Delhi. Central Council for Research in Unani Medicine, Dept. of AYUSH, Ministry of H & FW, Govt. of India; 2007: p. 49-50.
34. Wood JRI, Williams BRM, Mitchell TC, Carine MA, Harris DJ, Scotland RW. A foundation monograph of *Convolvulus L.* (*Convolvulaceae*). *Phytokeys*. 2015; 51:1-282. <https://doi.org/10.3897/phytokeys.51.7104>