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## ***Sirka* (vinegar): A potent Unani drug**

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### ABSTRACT

*Sirka* (vinegar) is used since thousands of years for flavouring, preserve foods and therapeutically. Vinegar is derived from the French word *vin aigre*, meaning “sour wine”. It is prepared with the help of an organism called *Ummul khal* (mother of vinegar) which play a key role in fermentation. Fermentation made from any fermentable carbohydrate source, dates, apples, grapes, sugar cane, honey, malt, grains, whey etc. In Unani medicine, the term *sirka* is commonly applied for *Sirka angoori* (vinegar of grapes) which is used both internally as well as externally due to its *Saree-al-nufooz* (rapidly diffusible), *muhallil* (resolvent), *qabiz* (astringent) properties in many diseases. In vinegar 4-5% of hydrogen acetate is found which is called as Jauhare *Sirka*. In India, the most commonly used and prepared *sirka* is of Aab e neeshkar (Sugarcane juice) or of Jaggery called as *Sirka Qandi*.

**Keywords:** *Sirka*; Vinegar; *Saree-al-nufooz*; Unani medicine.

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## INTRODUCTION

*Sirka* (Vinegar) is a very common drug which is used for the treatment of different ailments since ancient times in Unani System of medicine. It is prepared by the fermentation of various juices and grains like; Grapes, Sugar cane juice, Jaggery, Sugar, Fig, Jamun, Jangli pyaaz, rice or honey<sup>1,2</sup>. *Sirka* angoori is the most commonly used *sirka* that is prepared by the juice of grapes<sup>1</sup>. There are different methods of preparation of *sirka* described in Unani classical literature. The juice is attenuated with the heat of sunlight or wine; kept in open containers and converted into vinegar at 60-80° F or at room temperature for few months. *Sirka* is prepared with the help of an organism called *Ummul khal* (mother of vinegar) or *mycoderma aceti* which play a key role in the process of fermentation<sup>1</sup>. Due to *Saree-al- nufooz* (rapidly diffusible), *muhallil* (resolvent), *qabiz* (astringent) properties of *sirka*, it is used internally as well as externally in many diseases. In vinegar 4-5% of hydrogen acetate is found which is called as *Jauhare Sirka*. In India, the most commonly used and prepared *sirka* is of Aab e neeshkar (Sugarcane juice) or of Jaggery called as *Sirka Qandi*. But in Iran, *sirka* of grapes is prepared and used widely as grapes is abundantly cultivated and found. In European countries, less concentrated wine is used in the preparation of *Sirka* or different aromatic drugs are added in Glacial acetic acid and *sirka* is prepared. *Hakeem Najmul Ghani* has stated in his book '*Khazainul advia*' with reference to *Hakeem Ghulam Imam* that *sirka* has both nutritive and medicinal properties. If *Sirka* is passed under the process of distillation then the distillate *Sirka* will be more potent<sup>1</sup>. Similarly, best *Sirka* is considered to be that in which sweetness, sour taste and fragrance are in moderate conditions.

### Vernacular Names:

English: Vinegar<sup>1,3,4</sup>

Arabic: Khal<sup>2,5</sup>

Hindi: Sirka<sup>2</sup>

Urdu: Sirka<sup>2</sup>

Persian: Khale<sup>2</sup>

Scientific name: Acetum vinegar<sup>5</sup>

### Ethnobotanical Description

The word "Vinegar" is derived from an old French word "*Vin aigre*" means "Sour wine". Vinegar is a liquid obtained from the fermentation of ethanol in a process that yields its chief ingredient, acetic acid. Natural vinegar contains smaller amount of tartaric acid, citric acid and other acids. It

has been used for therapeutic purposes since thousands of years. Louis Pasteur, in 1864, showed that vinegar results from a natural fermentation process <sup>6</sup>.

### **History of Sirka**

According to Vinegar Institute, <sup>7,8</sup> the history of use of Vinegar can be traced back over 10,000 years. In fact, flavoured vinegars have been manufactured and sold for almost 5000 years. The wide variety of vinegars available today is nothing new. Until sixth century BC, the Babylonians were making and selling vinegars flavored with fruit, honey, malt etc. to gourmets of the time. In addition, the Old Testament and Hippocrates recorded the use of vinegar for various medicinal purposes <sup>7,8</sup>. Albucazes in 1100 made the statement that colorless vinegar must be distilled over a low fire. Basilius Venentinus, a monk, in the fifteenth century found that by distilling weak vinegar, a stronger product could be obtained. The Geber in the seventeenth century discovered increasing the strength of wine vinegar by distillation. Chemist Stahl in the first half of eighteenth century discovered the sour principle of vinegar, as acetic acid. In 1790, Loewitz reported that running weak acetic acid over charcoal would strengthen it. Durande in 1778 made a more concentrated product and called it glacial acetic acid. The first complete analysis of acetic acid was made by Berzelios in 1814. Dobereiner proved that alcohol was oxidized at the expense of oxygen and produced acetic acid and water. In 1823 Schutzenbach introduced the quick process of manufacturing vinegar based on Dobereiner's theory of formation of acetic acid from alcohol <sup>9</sup>. In 1955 Joslyn reported that Hromatka developed a new method of making vinegar called as submerged acetification (Crues 1958) <sup>9,10</sup>.

### **Preparation**

Vinegar is prepared from wine, cider, beer, fermented fruit juice or any other liquid containing alcohol (ethanol) by the oxidation process. Commercially, it is prepared either by fast or slow fermentation methods. Slow methods are generally used for the preparation of traditional vinegars. In this method, fermentation proceeds slowly over the course of weeks or months. The longer fermentation period allows for the accumulation of non toxic slime composed of acetic acid, bacteria and soluble cellulose, known as mother of vinegar. In fast method, mother of vineger is added to the liquid and air is supplied by venture pump system, i.e. a turbine to promote oxygenation to give the fastest fermentation. Thus, by this process, vinegar may be prepared in a period between 20 hours and 3 days <sup>6</sup>.

### **Varieties of *Sirka* used in Unani medicine**

#### **Sirka-e Seb (Apple) or Bihi (Quince fruit) or Naashpaati (Avocado)**

It strengthens digestive system and hence promotes digestion [1].

**Sirka-e Jamun (black plum) or Taadi (plum)**

It acts as tonic for stomach and spleen <sup>1</sup>.

**Sirka-e Jangli pyaaz (wild onion)**

It helps to remove sticky humours from the body, increases digestive power, clears the voice, increases vision and also beneficial for the people suffering from *Melancholia*, *Junoon* (madness), *Sara* (epilepsy), *Irqunnasa* (sciatica), *Hisate masana* (cystic stones) etc <sup>1</sup>.

**Sirka-e Qand (Jaggery)**

Distillate of this sirka which is obtained by addition of Pudina is more concentrated, *saree-al-nufooz* (rapidly diffusible) and *murakkabul quwa* (multipotent). It resolves *Warne Tihal* (splenomegaly) removes obstruction and also acts as antihelminthic <sup>1</sup>.

**Mizaj (Temperament)**

The thorough survey of classical Unani texts reveals that the mizaj of sirka is Cold and Dry and the degree of mizaj depends on the ingredient from which it is prepared. In Unani system of medicine when sirka is said then it is considered to be sirka angoori. Thus the mizaj of Sirka e angoori is:

- Cold 2<sup>0</sup> and dry 2<sup>0</sup>
- Cold 2<sup>0</sup> and dry 3<sup>0</sup>
- Cold 3<sup>0</sup> and dry 3<sup>0</sup>
- *Murakkabul Quwa* (Multipotent)<sup>1</sup>

Vinegar is made up of both hot and cold component in which coldness is dominant, and hence it is called as *Murakkabul Quwa*. The vinegar which is pungent is due to hot and less pungent or less concentrated is due to moist and coldness. The coldness of vinegar can be reduced by boiling <sup>5</sup>.

**Af'al (Actions) <sup>1,3,4</sup>**

- Hazim (Digestive)
- Mushtahi (Appetizer)
- Jali (Cleanser)
- Qate Safra (Anti-bilious)
- Mufatteh sudad (Deobstruent)
- Saree-al-nufooz (Rapidly diffusible)
- Musakkine alam (Analgesic)
- Qate akhlate ghaleeza
- Muhallil (resolvent)
- Qabiz (Astringent)

- Mujaffif (Desiccant)
- Qatile kirme shikam (Anti- helminthic)
- Mulattif (Demulcent)

### **Nafae Khas (Main Actions)**

*Mushtahi* (appetizer), *Jali* (cleanser), *Qabiz* (astringent), *Munafiz* (rapidly diffusible), *Radae* (Divertives) and *Muhallil* (resolvent) <sup>3</sup>.

### **Indications mentioned in Unani literature**

***Sudae haar* (headache due to hot temperament) or *Sarsaam e Haar* (Meningities due to hot temperament)**

The external application of Sirka along with *Roghane Gul* (rose oil) or *Roghane Zaitoon* (olive oil) is indicated in *Darde Sar Haar* (headache due to hot temperament) and in *Sarsaame Haar* (Meningities due to hot temperament) <sup>1,5</sup>.

### **Catalyst**

It acts as a catalyst when used with other drugs for fast absorption and penetration of drugs into the tissue <sup>1</sup>.

### **Nasal block**

Inhalation of sirka helps to remove nasal block <sup>1</sup>.

### **Otalgia**

It is used as eardrops to relieve pain in otalgia <sup>1</sup>.

### **Worm infestation**

Ingestion of Sirka helps to remove intestinal infestation of worms <sup>1</sup>.

### **Indigestion**

It is helpful in indigestion by promoting digestion and strengthening digestive system <sup>1,4,5,11</sup>. It acts as appetizer, hence used in pickles and other dishes <sup>1</sup>.

### **Amraze balghamia**

Due to antiphlegmatic action it liquefies the sticky morbid phlegmatic humours and removes them from the body <sup>1,4,5</sup>.

### **Wounds**

Local applicatin of Sirka with shahad (honey) heal the wound, clean the impurity and hence used in gangrene, humra (erysipelas) and other inflammatory conditions <sup>1</sup>.

### **Cough**

Oxymel, a popular ancient medicine composed of honey and vinegar, was prescribed for persistent coughs. The formulation of oxymel was detailed in the *British Pharmacopoeia* (1898) and the *German Pharmacopoeia* (1872), and, according to the *French Codex* (1898), the medicine was prepared by mixing virgin honey 4 parts, with white wine vinegar 1 part, concentrating and clarifying with paper pulp<sup>12</sup>.

### **Vitiligo**

It removes bahq wo bars when applied locally on affected area<sup>1</sup>.

### **Dryness of skin**

It acts as moisturiser in case of dryness of skin<sup>1,4</sup>

### **Hearing disorders**

Fumigations of sirka is helpful in hard of hearing, tinnitus and vertigo<sup>1,5</sup>.

### **Brain tonic**

Inhalation of sirka, strengthens the brain<sup>1</sup>.

### **Thirst**

It quenches thirst when consumed in plain water sip by sip<sup>1</sup>.

### **Obesity**

Consumption of sirka regularly in diet helps to reduce obesity<sup>1,11</sup>.

### **Fever**

Sirka is used with water for sponging the body in high fevers<sup>1,11</sup>.

### **Gout**

Sirka is useful in gout patients when used with sulphur as a douche<sup>5</sup>

### **Antidote**

Sirka is applied on Scorpion bite or on other insect bites as an antidote. Grape vinegar with salt is used in dog bite<sup>5</sup>. It also used as an antidote in Opium and hemlock poisoning<sup>5</sup>.

### **Miscellaneous**

It is used in various liniments and oils which are readily used for massage as it rapidly absorbs in tissues and relieve muscular stiffness and pain<sup>1,5</sup>. Local application of woolen pack soaked in vinegar is used to stop the swelling of wounds. It is also useful in creeping ulcers, scabies, ring worms and heals the burn more quickly than any other drug<sup>1,5</sup>. A mouthwash or gargling with addition of common salt or alum is useful in case of throat pain, tooth ache, bleeding gums etc<sup>1,5</sup>. It is also used in uterine hemorrhage<sup>13</sup>. Vinegar is smeared with honey to prevent dark circles but its constant use weakens the eye sight<sup>5</sup>.

### **Contraindications mentioned in Unani Literature**

- Arthritis and low back ache <sup>1,5</sup>
- Cold temperament people <sup>1,5</sup>
- Lean and thin people <sup>5</sup>
- People with dark complexion <sup>5</sup>

#### **Mazarrat (Side effects)**

- Harmful for the persons of cold temperament <sup>1,14</sup>
- Weakens nerves and Quwate bah (sexual power) <sup>14</sup>.
- Harmful for uvula <sup>5</sup>

#### **Musleh (Corrective)**

Correctives are added in the drug to avoid the side effects or to enhance the action of the drug in Unani System of medicine. Through this, one can observe least side effects in a drug after consuming it for a longer period. For Sirka, the correctives are mentioned according to different conditions which are as follows.

- *Sheereen Halwajat* , *Shehad khalis* (Pure honey) (*Maqzunul mufradat*), *Aab e neeshkar* (sugarcane juice) are used in *Haar amraz* (Hot temperament diseases)<sup>5</sup>.
- *Roghane badam* (almond oil) is used as *musleh* in cough.<sup>1</sup>
- Grapes juice is used as *musleh* in old age people, women and children <sup>1</sup>.

**Badal (Substiute):** Aabe lemo kaghazi , sharab <sup>1,3</sup>.

**Miqdare Khurak (Dosage):** 25 ml <sup>1</sup>

#### **Murakkabat (Compound formulations)**

- Sikanjabeen Sada <sup>15</sup>
- Sikanjabeen Leemo <sup>15</sup>
- Sikanjabeen Unsuli <sup>15</sup>
- Sikanjabeen Asli <sup>15</sup>
- Sikanjabeen Buzoori <sup>15</sup>
- Zimade bahq <sup>2</sup>
- Zimade Jarb <sup>2</sup>

#### **Chemical Constituents**

Natural vinegar contains acetic acid, smaller amount non volatile oils, organic acids, malic acid, tartaric acid, citric acid and other acids. Other constituents of vinegar include vitamins, mineral salts, amino acids, polyphenolic compounds (eg; galic acid, catechin, caffeic acid, ferulic acid) <sup>12</sup>

#### **pH Value**

The pH value of vinegar is typically in the range of 2.5 to 3 depending on the concentration of acetic acid. Commercially available vinegar has a pH value of about 2.4<sup>6</sup>.

### **Density**

Vinegar has a density of approximately 0.96gm/ml. The level of density depends on the acidity of vinegar<sup>6</sup>.

### **Scientific Reports**

#### 1. Hypolipidaemic activity

A Scientific study has concluded that the rats fed with acetic acid (the main component of vinegar), significantly decreases the values of serum total cholesterol<sup>12</sup>.

#### 2. Anti infective activity

A study has reported that the use of vinegar was found to be effective in cleaning wounds and in the treatment of bed sores<sup>12</sup>.

#### 3. Hypoglycaemic activity

A number of clinical trials have reported that approximately 20ml or two table spoons of domestic vinegar reduced the glycaemic index of carbohydrate food for the people with or without diabetes<sup>12</sup>.

#### 4. Anti Obesity

Multiple clinical trials indicate that taking vinegar with food increase satiety (the feeling of fullness) and so reduce the amount of food consumed. Even a single application of vinegar can lead to reduced food intake for a whole day hence helps in weight reduction<sup>12</sup>

#### 5. Anti hypertensive activity

Kondo and colleagues reported that a significant reduction in systolic blood pressure (approximately 20 mm Hg) was observed in spontaneously hypertensive (SHR) rats fed a standard laboratory diet mixed with either vinegar or an acetic acid solution (approximately 0.86 mmol acetic acid/day for 6 weeks) as compared with SHR rats fed the same diet mixed with deionized water. These observed reductions in systolic blood pressure were associated with reductions in both plasma renin activity and plasma aldosterone concentrations<sup>12</sup>.

### **CONCLUSION**

The above information regarding Sirka is in accordance with both Unani and modern literature. This is a classical approach to explore the hidden treasure of medicines which is being used by Unani, Ayurveda and other traditional practioners for its medicinal value since antiquity. Nowadays people are more concerned about the safety of drug and therefore inclined towards

herbal medicine. Further researches should be conducted on different forms of vinegar and on different actions to evaluate its medicinal properties and also to validate the claims of Unani physicians for its different pharmacological actions.

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