

# Pharmacognostic and Pharmacological Review on *Allium sativum*

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**Abstract:** *Allium sativum*, also known as Clove Garlic belongs to Liliaceae family. It has been used as a medicinal agent for thousands of years. Garlic is one of the most important bulb vegetables, which is used as spice and flavouring agent. It has pharmaceutical effects and used to cure a vast conditions including blood pressure and cholesterol, anthelmintics, antifungal and wound healing, obstinate skin disease including leprosy, and itches, indigestion, respiratory tract infection, ear conditions, diabetes, and night blindness. Garlic has shown anti-viral, anti-bacterial, antifungal, and anti-cancer Properties. Different pharmacological experiments in a number of in vitro and in vivo models have convincingly demonstrated the ability of *Allium sativum* to exhibit Anti-inflammatory, Antidiabetic, Anti-Protozoal, Antibacterial, Antispasmodic, Antihypertensive, Anticoagulant, Anti-tumor.

**Keywords:** *Allium sativum*, Pharmacological activities, Medicinal uses

## I. INTRODUCTION

Garlic (*Allium sativum*) is among the oldest of all cultivated plants. Garlic is a perennial bulb, thought to be indigenous to Central Asia, Siberia and west of the Himalayas and has been grown in England from before 1540. It is now widely cultivated all over the world. Garlic is a common food for flavour, spice and it is one of the herbs most commonly used in modern folkloric medicine.<sup>[1]</sup> Garlic was an important medicine to the ancient Egyptians as listed in the medical text Codex Ebers (ca.1550 BC) especially for the working class involved in heavy labour because it was an effective remedy for many ailments such as heart problems, headache, bites, worms and tumours.<sup>[1]</sup>

### 1.1 Plant Profile



Fig.1 Garlic whole plant



Fig.2 Garlic bulb

**Medicinal Species:** *Allium sativum*

**Botanical Family:** Liliaceae

**Common Names (Synonyms):** Garlic (Eng.), lasun (Hindi), Ransom & Lahsuna (Sanskrit), Knoblauch (Ger), Knoblauchzweibel (Ger), da suan (Chin), taipan (Jap), ionic (Jap), taesan (Kor), tafanuwa (Hausa), Ayo-ishi (Igbo), kitunguusumu (Swahili), ayu (Yoruba), lobha (Nepalese).

**Geographical Source:** Central Asia, Southern Europe, USA, India.

**Chemical Constituents:** Allicin is an odorless sulfur containing chemical derived from the amino acid, cysteine. When garlic bulbs are crushed, alliin is converted into another compound called allicin. Allicin is further broken down to a

compound called ajoene, which may be the substance that inhibits blockage in blood vessels from clots and atherosclerosis.

- Allicin an amino acid which gives Garlic its strong odour and is responsible for The powerful pharmacological properties of the plant.
- Germanium
- Magnesium
- Selenium
- Vitamin A
- Vitamin C
- Volatile oil of which about 0.5% is composed of sulfur-containing compounds.
- Zinc

It also contains 65% water, 28% carbohydrate, 2.3% organosulphur compound, proteins, 1.2% Free amino

### Taxonomical Classification

Kingdom	Plantae
Sub-kingdom	Phanerogams
Class	Monocotyledons
Series	Coronarieae
Family	Liliaceae
Genus	Allium
Species	sativum

### Pharmacological Effects of *Allium sativum*

*Allium sativum* (Garlic) is one of the edible plants which have produced a lot of interest throughout human History as a therapeutic panacea. Garlic is one of the most widely researched medicinal plant and they are typical odour and antibacterial activity depends upon allicin produced by enzymatic activity of allinase.

S-allyl cysteine sulfoxide (SACS), the precursor of Allicin and garlic oil, are sulphur containing amino acids, Which are believed to account for most of its medicinal properties for example-controlled lipid peroxidation better than Glibenclamide and Insulin. It also improved diabetic conditions.

### Antidiabetic Effects

The component allicin increases hepatic metabolism increases the release of insulin. It exhibits Insulin sparing effect by competing with the insulin activating compound as a result more insulin Becomes free to act and exert greater antidiabetic effects.<sup>[2]</sup>

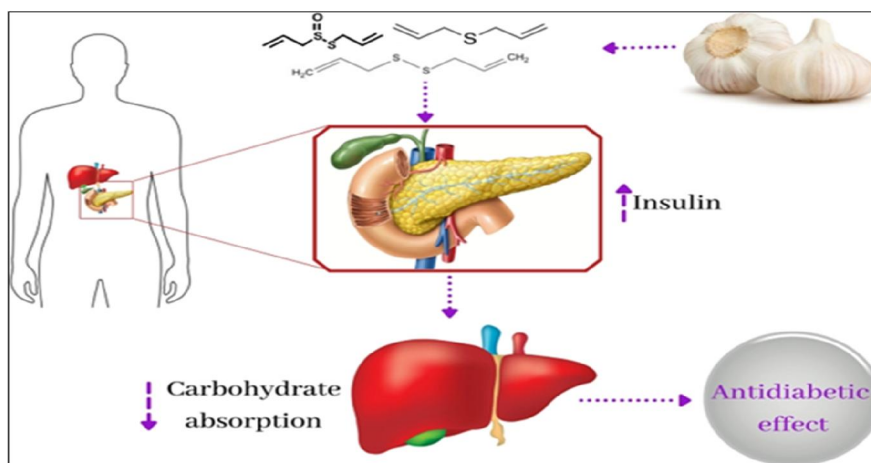


Fig. Antidiabetic Effect

### Antifungal Activity

Ajoene is an active compound found in garlic which plays a great role as topical antifungal agent. Garlic has been shown to inhibit growth of fungal diseases as equally the drug ketoconazole, when test on the fungi *Candida albicans*, *Aspergillus*, *Cryptococcus* and other *Candida* species. In the report, the Chinese compared the effectiveness of the garlic with standard medical treatment which involved a very toxic antibiotic called Amphotericin-B. The study revealed that, intravenous garlic was more effective than the drug and was not toxic regardless of its dosage. Garlic oil can be used to treat ring-worm, skin parasites and warts if it is applied externally<sup>[3]</sup>

### Antiprotozoal Activity

Garlic is effective in treating intestinal parasites has been known for a long time. An extract of garlic was effective against a host of protozoa such as *Opalina ranarum*, *Opalina dimidicita*, *Balantidium entozoon*, *Entamoeba histolytica*, *Trypanosoma*, *Leishmania*, *Leptomonas* and *Crithidia*. In addition, it was efficacious at killing wild-type amoebae isolated from the diseased fish, slowing the clinical signs of amoebic gill disease (AGD).

### Wound Healing Activity

Successful wound healing depends upon angiogenesis, and impaired angiogenesis is a hallmark of the chronic wounds encountered with diabetes and venous or arterial insufficiency. To intervene and improve wound closure, it is essential to investigate the effects of different natural remedies in wound healing. Study was done on the chicken dorsum skin excision wound assay to investigate the influence of different concentrations of aged garlic solution (AGS) on wound healing.

### Diuretic and Digestive Activity

It has reported that garlic acts as a diuretic which helps to get rid of body liquids. It may act as a very useful resource in case of rheumatism, gout, arthritis, Hidropesia, edemas. It eases digestion by stimulating the liver, the gall bladder and the pancreas although its use should be avoided when existing hyperchloridia (stomach acidity) and also when having frail stomachs (Eat it raw or crushed and Mixed with butter).

### Anti-Tumor Effects

Garlic extracts used as inhibition of cancer development in the Presence of known tumor promoters and Sulphurous components present in garlic are believed to be liable to evade the developing of cancerous cells in stomach, liver, and other organs of human.<sup>[4]</sup>

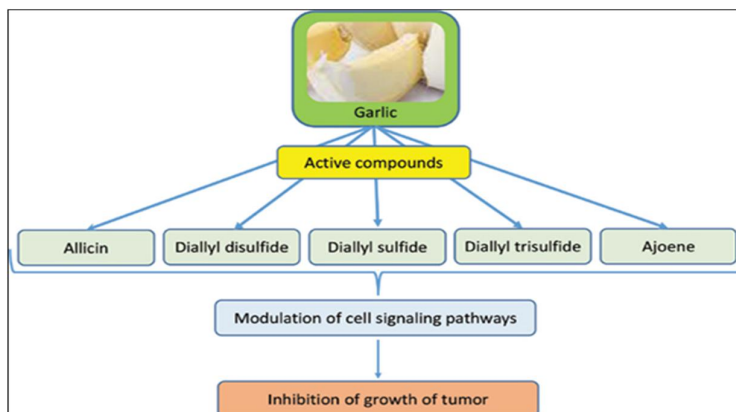


Fig. Anti-tumor effect

### Antihypertensive Activity

Garlic powder is used to cure hypertensive. According to Silagy and Neil garlic extracts has a significant reduction in systolic blood pressure (SBP) and in diastolic blood pressure (DBP) and act as anti-hypertensive<sup>[5]</sup>

**Importance of *Allium sativum***

**Medicinal Parts Used:** Fresh bulbs, dried bulbs, and Garlic oil.

**Culinary uses:** It is an important spice or condiment and is chiefly used for flavouring and seasoning vegetable and meat dishes. Most often the bulb is used either eaten raw or cooked. When cooked the whole Bulb can be roasted in olive oil in an oven and eaten whole, or the cloves are used as flavouring. Garlic can also be dehydrated and preserved in oil. Garlic can also be pressed for Its oil, and pickled. The garlic flower stems (scapes) are also edible and used in cooking.<sup>[7]</sup>

**Medicinal uses:**

**Bacterial and Viral Conditions**

It Fights against bacteria like an antibiotic. Inhibits the growth of different Species of microorganisms. Garlic is reported to be more effective than penicillin agains:

- The organisms responsible for cholera, dysentery and enteritis.
- Paratyphoid disease & Typhus disease.
- Putrefactive intestinal bacteria & Streptococcus and staphylococcus bacteria.
- Blood Conditions.
- Dissolves blood clots.
- Reduces fat levels in the blood.

**Cardiovascular Conditions**

- Angina pectoris & Arteriosclerosis.
- Controls & Balances blood pressure.
- Decreases triglycerides.
- Helps to maintain healthy blood circulation.
- Improves blood circulation by Lowering blood pressure.
- May prevent blood clots.
- Mild hypertension.
- Also Prevents thrombosis.
- Protects against cardiovascular disease.
- Reduces blood pressure in hypertensive conditions.

**Ear Conditions**

- Garlic oil drops can be used for Ear ache.

**Gastrointestinal Conditions**

- Chronic stomach and intestinal catarrh.
- Digestive infections Relieves belching and heaviness.
- Rids the body of intestinal parasites, especially pinworms.
- Stimulates the activity of the digestive organs like ulcers.

**Immune System Conditions**

- Fights infection Improves resistance to infection.
- Increases the activity of white blood cells and T-helper cells.
- Preventative measure for infectious diseases.
- Stimulates the body's natural defences against foreign invaders.

**Respiratory Tract Conditions**

- Asthma.
- Breathing difficulties.

- Chronic bronchitis.
- Colds (reduces symptoms faster), Coughs and hoarseness.

**Metabolic Conditions**

- Balances blood sugar.
- Late-onset diabetes.

**Liver Conditions**

- Lowers cholesterol while increasing the level of beneficial HDL's (high-density lipoproteins).
- May help lower homocysteine levels.
- Regularizes liver and gallbladder activity.
- Stimulates the production of the liver's own detoxifying enzymes which neutralize carcinogens And other Environmental toxins.

**Skin Conditions**

- Acne.
- Cutaneous eruptions.
- Pimples.

**Dietary Garlic may also offer some protection against the development of:**

- Purifies blood by thinning the blood (which reduces the risk of heart attack and stroke).<sup>[6]</sup>

**Externally:**

**Garlic is used in Oil, Ointments or Poultices for:**

- Abscesses.
- Arthritis.
- Dispelling hard swellings.
- Toothache.
- Wounds.<sup>[9]</sup>

**II. CONCLUSION**

Garlic, from crushed to capsules, is consumed throughout the World. This abstract demonstrates by documented studies the benefits of garlic for its anti-microbial, antioxidant and anti-inflammatory potential. It has been used to treat cardiovascular diseases, including atherosclerosis, strokes, hypertension, thrombosis and hyperlipidemias, as well as uses in alzheimer's, diabetes, and cancer. Most impressive and Unique are its use and safety in children. Garlic stands as the second most utilized supplement.

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