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AN OVERVIEW OF ALLIUM SATIVUM

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Abstract:

Garlic it is a oldest cultivated plant. Allium sativum is also know as clove garlic it is a part of the Liliaceae family. Garlic is a common bulb vegetable it is used as an herb and flavour food. The Allin is converted to allicin. Allicin is a major bioactive compound found in garlic. It show wide range of health effects to treat various infectious disease and metabolic and genetic disorders. Garlic contain different useful minerals and vitamins and other substance. Garlic product are used as sources of medicine in many ways in their day today life. Garlic has been ability to control the spread of large group of microorganism. Garlic inhibits platelet aggregation and enhance fibrinolytic activity. Garlic it controls the blood sugar level in different mechanisms. Garlic is also effective in the cancer prevention. In-vitro studies and animal data it suggest the garlic help to prevent solid tumours. Garlic has pharmaceuticals effects and used to cure a Hepatoprotective, Anti-inflammatory, Anti-oxidants, Anti-fungal, anthelmintics, arthritis, asthma, wound healing. The main interest of research in the medicinal values of garlic is its broad-spectrum therapeutic effects with minimal toxicity.

Key Words:-Allium Sativum, Allicin, Anti-inflammatory, Anti-oxidants, Anti-fungal, Anthelmintics.

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INTRODUCTION: -

The ability of medicinal plants is crucial to their survival against a variety of predators. The fact that these plants create secondary metabolic chemicals of defensive significance and store them in their various parts (seeds, leaves, flowers, etc.) These substance and materials have the potential to help treat a wide range of illness that adversely affect.

It has been discovered that several phytochemicals can be utilized effectively to cure a wide range of human aliments, Which can have a flavour long term usage of these substance has been shown impact on human health. More than 13,000 plant species have been employed as local or traditional cures, unique legal frameworks for the regulation of traditional medicine is generally lacking. As a results, the World Health Organization works to promote the safe application of several medications or treatments.

HISTORY:-

- Garlic is a fundamental ingredient in many cuisines worldwide, renowned for its pungent flavour and aroma. Native to central Asia and Mediterranean, it has been cultivated for over 7000 years.
- Ancient Mesopotamia (4000-3000) Garlic was first domesticated and cultivated in Mesopotamia. Where it was used for culinary and medicinal purposes.
- Ancient Egypt (3000-300BC) Garlic was highly valued in Egyptian cuisine and medicine. It was used to treat various aliments, including indigestion, and was even placed in tombs to protect the decreased from evil sprits.
- Ancient Greece and Rome (8^{th} century BC) and (5^{th} century CE). Garlic was used extensively in Greek of roman cuisine, medicine, and even as a from of currency. It was believed to antibacterial properties.
- Middle age (5^{th}-15^{th} century CE) Garlic was used towards off the plague and other disease during the middle ages. cuisine.
- Modern Era (19^{th} 20^{th} century CE) Garlic became widely available and its health benefits were extensively researched. It is valuable ingredient in many cuisine and world wide.

Fig:-1

Synonyms:-
Garlic, Lasan, Ayu,
Biological source:-
Garlic consist of ripe bulbs of Allium sativum, belonging to family Liliaceae**.**
Odor:-
Pungent smell
Colour:-
White and light yellowish colour
Common names:- Telugu:- vellulli English:- Garlic Hindi:- Lasun Kannada:- Bellulli Malayalam:- vellulli Tamil:- poondu
Geographical Source:- Asia, Europe, India, USA. **Classification:-**
Phylum:- Magnoliophyta Class:- Liliopsida Order:- Asparagales
Family:- Liliaceae Genus:- Allium
Species:- Allium sativum Common name:- Garlic
Chemical Constituents:-
Garlic contain sulphur compounds and it is main chemical constituents for allium sativum.
Garlic contains carbohydrates, proteins, fats, mucilage, and essential oils. The volatile oils is the main active constituent. It contain allicin, allyl propyl disulfide, and Allin. Allin is converted into allicin by action of enzyme alliinase. Ajoene is also one of the important constituents of garlic. Allicin is also highly unstable and quickly decompose of sulphur compounds and oxidized with diallyl sulphide, diallyl trisulfide, ajoene, and hydrogen sulphide. Garlic contain minerals including germanium, selenium, and also present in enzymes are vitamins like peroxidase, alliinase and tyrosinase. Garlic contain some phenolic acid such as gallic acid, caffeic acid.

Cultivation of Garlic:-

Garlic is one of the plant it is easy to grow. Garlic plant grow in cold climate. In cold climate cloves are best planted about six weeks before the soils freezes. The garlic contain Hard-Neck garlic and Soft-Neck garlic are among the most sensitive species to the length of the daily period compared to other type of garlic. Garlic can be grown through sexual reproduction. Garlic is a crop capable of growing in diverse climatic condition but grow best at the elevation of(1000-1300M) above sea level. The neutral PH soil (6-7) is highly suitable for the crop. The performance of bulb is not good in alkaline and saline soil. Cloves are planted 4-6 inches apart, with the pointed end facing upwards. Garlic requires consistent moisture, especially during the first few months after planting. Garlic benefits from regular fertilization, especially with nitrogen and phosphorus. Pest and disease management at regular monitoring and controls of pests and disease, Such as aphids, mites, and fungal infections. Harvesting of garlic is ready to harvest when the tops begin to yellow and fall over, usually 3-4 months after planting. Harvested garlic is dried and cured to preserve it for storage and use.

Fig:-2

Garlic Nutrients:-

Fresh raw garlic bulbs consist of water, carbohydrates, proteins, amino acids, dietary Fibers, fatty acids, oleic acids, trace minerals and more than 34 sulphur containing compounds. Vitamins C and Vitamin B6 it is essential for cell growth and development. It contain antioxidants are protect against cell damage and oxidative stress. Garlic contain various phytochemicals including, flavonoids, phenolic acids and sulphur compounds. The nutrients and compounds contribute to garlic potential health benefits, including, Cardiovascular health, Immune system support, Anti-Inflammatory properties, Antioxidant effects, Antiviral effects, Antimicrobial effects, Digestive health supports. Nutrient content may vary depending on garlic variety, growing condition, and preparation method.

Morphology Characteristics of Allium Sativum:-

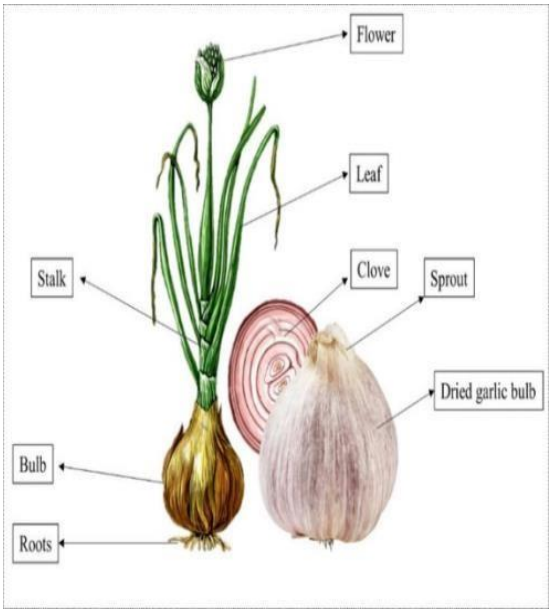

Fig:-3

Plant Morphology:-

Bulb:- Underground composed of 4-20 cloves surrounded by a paper skin.

Cloves:- Tear drop shaped 1-3cm long 0.5-1.5cm wide.

Leaves:- Linear flat 30-60cm long 1-2cm wide, green colour.

Steam:- 30-100cm tall green colour.

Inflorescence:- Umble like structure 2-6cm

Flowers:-Small white or pinkish colour, 3-4mm long.

Root Morphology:-

Fibrous root 10-20cm long and Tap root 1-2cm long

Bulb Morphology:-

Outer skin- papery, white or yellowish

Inner skin- thin, transparent

Flesh- white or yellowish

Materials and Methods:- Material collection:-

- Garlic bulbs are harvested when mature and dried to reduce moisture content.
- Cloves are separated and cleaned to remove papery skin and any debris.

Garlic bulb selection:-

- Choose healthy, mature garlic bulbs with no signs of mould, root or damage.
- Select bulb with a high solid content and

low moisture levels.

Harvesting :-

- Garlic is typically harvested in late summer or early fall, when top of the plants begin to yellow and fall over.

Sorting and cleaning :-

- Sort bulbs by size and quality.
- Remove any debris, dirty or papery skin from the bulbs.

Cloves separation:-

- Separate the individual's cloves from the bulb.
- Remove any remaining paper skin or debris from the cloves.

Inspection:-

- Inspect the cloves for any science of damage, Mold or root.
- Remove any defective cloves.

Pre-processing:-

- Wash the cloves with clean water to remove any dirty or debris.
- Dry the cloves with a clean towel or air dryer to remove excess moisture.

Storage:-

- Store the cloves in a cool, dry place to preserve freshness.
- Keep the cloves away from direct sunlight and moisture.

Methods:-

Drying Method:-

- Air drying garlic cloves are tried in small bunches and hung upside down in a warm, dry, dark place.
- Machine drying garlic cloves are dried using machines that circulate hot air or use infrared radiation.
- Freeze drying garlic cloves are frozen and then subjected to a vacuum that removes the moisture.

Purification Methods:-

- Filtration- extract are filtered to remove impurities.
- Centrifugation- Essential oils are centrifuged to remove impurities.
- Distillation- Essential oils are distilled to purify.

Concentration Method:-

- Evaporation- Extracts are evaporated to concentrate.
- Spray drying- Extract are spray dried to concentrate.
- Freeze drying- Extract are Freeze dried to concentrate.

Formulation Method:-

- Powdering dried garlic is powdered.
- Capsule filling powdered garlic is filled into capsule.
- Tablet compression powdered garlic is compressed into tablets.
- Oil encapsulation garlic oil is encapsulated in soft gels.

Extraction methods:-

- Solvent extraction- Garlic is extracted using solvents like ethanol, methanol, or hexane.
- Hydro-distillation- Garlic is steam distilled to extract essential oils.
- Cold pressing- Garlic is pressed to extract juice.
- Supercritical fluid extraction- Garlic is extracted using high pressure CO2.
- Enzyme assisted extraction- Garlic is extracted using enzyme to break down cell walls

Extraction Preparation: -

Take sort and clean garlic cloves and remove the debris

Wash garlic cloves with clean water

Dry garlic cloves with a clean towel or air dryer to remove excess moisture

After drying peel garlic cloves to remove papery skin

Garlic cloves are chop or crush garlic into paste

Pre-Treatment (freezing, blanching, enzyme inactivation)

After Pre-Treatment weigh accurately and prepared garlic material

After weighing mix garlic with solvent or other extraction medium

To finally ready for garlic extraction

Safety Precaution:-

- Wear protective gloves and goggles.
- Use fume hood when handling procedure.
- Follow proper disposal procedures for solvent.

Important Formulation:- Active compound:-

- Allicin responsible for garlic's medicinal properties.
- Allin converted to allicin when garlic is crushed and chopped.

Chemical structure:-

- Allicin-R-S-CH2-CH=CH-SO-OH

Pharmacological formulation:-

- Garlic oil contain allicin and other sulfur compounds.
- Garlic powder dehydrated garlic cloves.
- Garlic extract concentrate from of garlic's active compounds.

Medicinal Formulation:-

- Cardiovascular health garlic oil extract in capsules or tablets.
- Antimicrobial application garlic oil extract in topical creams or ointments.
- Immune system support garlic powder extract in capsules or tablets.

Culinary Formulation:-

- Garlic butter mix of softened butter and minced garlic.
- Garlic salt blend of salt and garlic powder.
- Garlic oil infused oil with garlic flavor and aroma.

Advantage of Allium sativum:-

- Garlic helps lower cholesterol and triglycerides reducing the risk of heart disease.
- Garlic exhibit antibacterial and antiviral properties making it effective against various infections.
- Garlic contains compounds that have been shown to have anti-cancer properties, particular in reducing the risk of stomach and colorectal cancers.
- Garlic stimulates the immune system, increasing its ability to fight off infections and disease.
- Garlic contains compounds that may helps prevent neurogenerative disease like Alzheimer's and Parkinson's diseases.
- Garlic promotes overall well-being supporting physical and mental health.
- Garlic is a versatile ingredients, adding flavor and nutrition to various dishes.

Disadvantages of Allium Sativum:-

- Garlic's sulfur compounds can caused bad breath.
- Garlic anticoagulant properties may increase bleeding risk during surgery or individuals with bleeding disorders.
- Garlic can cause skin irritation and allergic reaction in some individuals.

Pharmacological Activity:-

Garlic has been used as medicine to treat a variety of disease and condition related to the heart and blood system, including high blood pressure, high cholesterol, coronary heart disease, heart attack, and ''hardening of the arteries'' (atherosclerosis), as pronounced (Mikaili et al.2013). This is because garlic contain the biological active component allicin and its derivatives.

According to Amagase (2006), garlic has been shown to protect against a number of cancers, including lung cancer, breast cancer, prostate cancer, stomach cancer, colon cancer, rectal cancer, and cancers of the prostate and bladder. Additionally, it is used to treat cardiovascular disease such as colds, flu, hay fever (allergic rhinitis), diabetes, osteoarthritis, enlarged prostates (begin prostatic hyperplasia, or BPH), high blood pressure late in pregnancy (Pre- eclampsia), traveler's diarrhea, and fever. It is also used for boosting the immune system, preventing tick bites, and preventing and treating bacterial and fungal infections.

Moreover, Pendbhaje et al. (2000) enumerate garlic's medicinal properties. The herb is useful in treating a variety of conditions, including fever, cough, headache, nausea, gout, Nasal congestion, hemorrhoids, asthma, bronchitis, dyspnea, low blood pressure, high blood pressure, and snakebites. It is also used to keep the liver functioning normally and combat stress and exhaustion. Additionally, according to Jung et al. (2000), garlic has a promising effect against a number of conditions, including obstinate skin

disease like leprosy and leukoderma, indigestion, colic pain, enlargement of the colon, bronchitis, sciatica, lumbago, backache, bronchitis, chronic fever, tuberculosis, rhinitis, and malaria, discomfort, piles, fistula, and splenic enlargement. Bone fracture, gout, and disorders in the urine. Renal stones, diabetes, jaundice, anemia, cataracts, epilepsy, and night blindness. Garlic has an important part in the pharmaceutical industry and is used to treat disease that cause death, such has cardiovascular disease.

Antibacterial activity:-

A broad-spectrum antibiotic, garlic kills a variety of germs, renowned garlic research Dr. Tariq Abdullah declared in the prevention magazine issue from August 1987. Garlic has the largest range of any antibacterial agent that we known it is antifungal, antibacterial, antiparasitic, and antiviral properties. This attribute is a part of the allicin, a component of garlic that is released when a clove garlic. It is because of this compounds that fresh garlic has such a potent, sharp flavor. Using fresh garlic is necessary to obtain a consistent antimicrobial effect. It seems that garlic, either used topically or orally, has antibacterial properties. Researchers discovered that human participants ingesting garlic exhibited activity against fungus in their blood urine (Caporaso et al 1983).

Antiviral activity:-

Antiviral action against coxsackievirus species, herpes simplex virus type 1 and 2, influenza B, para influenza virus types 3, vaccinia virus, vesicular stomatitis virus, human immunodeficiency virus type 1, and human rhinovirus type 2 has been confirmed for garlic and its sulfur compounds. Ajoene, allicin, allyl methyl thiosulfate, and methyl allyl thiosulfate were the chemicals in garlic that show the most virucidal activity; alliin, diallyl disulfide, and diallyl trisulfide showed no virucidal activity. Several laboratory investigations have demonstrated that garlic is an efficacious treatment for both the influenza B virus and herpes simplex virus. Two different research in Japan and Romania have established that garlic is able to protect living creature from the influenza virus (Tsai et al., 1985). The most recent study to demonstrate significant protection against the common cold virus was a double blind placebo-controlled study. The garlic Centre's research, Which was published in advances in therapy, is the first comprehensive study to demonstrate the benefits of taking allimax powder capsule once daily for the prevention, treatment, and reduction of recurrent infections.

Antifungal activity:-

Garlic has been shown to inhibit the growth of fungal disease as equally as the drug ketoconazole when tested on the fungi Malassezia furfur, Candida Albicans, Aspergillus, cryptococcus, and other Candida species (Shams- Ghahfarokhi et al., 2006). Ajene, an active compounds found in garlic, plays a great role as a topical antifungal agent (Lederman and Apitz- Castro,2006). An article published in a Chinese medical journal describes the use of intravenous garlic as a treatment for cryptococcus meningitis, an uncommon and possibly lethal brain fungus infection. The Chinese contrasted the efficacy of garlic with conventional medical care in the report. Garlic oil can be used to treat ringworm, skin parasites, and warts if applied externally. Lesion caused by skin fungi in rabbits and guinea pigs were treated with external application of garlic extract began to heal after seven days (Sabitha et al., 2005). This suggests that infection such as candida may be controlled because garlic stimulate the body's own defenses. Than use the drugs and toxic regards its dosage (Lenar et al,.2007)

Antiprotozoal activity:-

It is well known that garlic works well to treat intestinal parasites. Garlic extract showed efficacy against a variety of protozoa, including Trypanosoma, Leishmania, Balantidium entozoon, Opalina dimidicita. Crithidia and Leptomonas (Ruter et al., 1996). In addition it proved efficient at killing wild-type amoebae isolated from the afflicted fish, slowing symptoms that indicate amoebic gill disease. Nevertheless, before employing garlic to treat amoebic gill disease in formed Atlantic Salmon is required.

Antiparasitic activity:-

Garlic is often recommended by herbalists worldwide as a treatment for intestinal parasites. Enemas with crushed garlic are used in certain cultures to treat youngsters afflicted with Helminthes infestations. An alcoholic extract made from crushed garlic cloves is one of the traditional Chinese medical therapies for digestive diseases. Entamoeba histolytica and other common intestinal parasites are susceptible to the anti-parasitic effects of allicin. Lumbricoides Ascaris and Giardia lamblia Researchers have discovered that at lower concentrations (5 µg/ml), allicin inhibited 90% of the virulence of trophozoites of E histolytica, as determined by their inability to destroy mono-layers of tissue-cultured mammalian cells in vitro.

Entamoeba histolytica, the human intestinal protozoan parasite, is extremely sensitive to allicin; only (30 µg/ml) utterly inhibits the growth of amoeba cultures (Mirelman et al., 1987).

Wound Healing activity:-
Angiogenesis is necessary for wound healing to occur, and required angiogenesis is a characteristic of chronic wounds associated with diabetes and venous or arterial insufficiency. Examining the impact of various natural remedies on wound healing is crucial if one is to intervene and enhance wound closure. An investigation into the effects of varying doses of old garlic solation (AGS) on wound healing was conducted using the chicken dorsum skin excision wound assay. AGS's effects on wound closure, re-epithelialization, dermal matrix regeneration, and angiogenesis were investigated using gross, histopathology, scanning electron microscopy (SEM), and computer based three-dimensional (3D) image-probing techniques (Jalali et al. 2009).

Anti-Diabetic activity:-
Garlic has been shown in several animal trials to be beneficial in lowering blood glucose levels in rats and mice with both alloxan- and streptozotocin-induced diabetic mellitus. Garlic has been shown in most trials to lower blood glucose levels in diabetic rats, mice, and rabbits. In a study conducted in Iran, rats with normal and streptozotocin-induced diabetes were given oral administration of garlic extract for 14 days to assess its effects on serum glucose, total cholesterol, triglycerides, urea, uric acid, and creatinine levels. Garlic extract administrations were found to significantly lower serum glucose, total cholesterol, triglycerides, urea, uric acid, creatinine, aspartate amino transferase, and alanine amino transferase levels in diabetic rats, but not in normal rats ($p<0.05$). However, serum insulin levels were found to increase in diabetic rats. It's interesting that glibenclamide and garlic extract's actions were compared, a well-known medication for diabetes. The garlic's antidiabetic impact was more potent than that glibenclamide was used to observe (Lidi et al. 2006) Regretfully, garlic's impact on those with diabetes is not thoroughly investigated because the findings are contradictory (Zhang et al. (2001)

Antihypertensive activity:-
Powdered garlic is used to treat hypertension. Silagy and Neil (1994) reported that 125 garlic extracts significantly lower blood pressure, both diastolic and systolic, and have anti- hypertensive properties.

Anti-Tumor activity:-
According to Pendbhaje et al. (2000), sulfurous components in garlic are thought to have the ability to prevent the development of malignant cells in the stomach, liver, and other human organs. Garlic extracts are used to suppress the development of cancer in the presence of recognized tumor promoters.

Liver protective/Detoxification effects:-
There have been claims that aged garlic extract protects the liver. According to (Amagase 2000), it has been proven in vivo using the liver poisons carbon tetrachloride, paracetamol (acetaminophen), and bromobenzene. It has been demonstrated to suppress the mutagenic effects of aflatoxin Blas pronounced as well as the production and bioactivation of liver carcinogenic nitrosamines (Borek 1998.).

Antioxidative and Radioprotective effects:-
According to Borek (2001), research have demonstrated that aged garlic extract and its many constituents have a variety of antioxidant and radioprotective actions. It has been demonstrated that they strengthen cells' antioxidative enzyme systems and shield white blood cells from radiation damage, liver cells from lipid peroxidation, and vascular endothelial cells from oxidant damage. According to (Oshiba et al. 1990) H31, they have been demonstrated to scavenge hydrogen peroxide, to prevent the production of TRA-RS, to shield the heart from the cardiotoxic anticancer drug doxorubicin, and to shield the kidneys from the antibiotic gentamicin.

Diuretic and Digestive activity:-
Garlic is said to have diuretic properties that aid in the removal of bodily fluids. For those suffering from rheumatism, gout, arthritis, hidropesia, or edemas, it might be a very helpful resource. By stimulating the pancreas, the liver, and the gall bladder, it facilitates digestion; nevertheless, its usage should be avoided in cases of hyperchlorhydria (stomach acidity) and in cases where the stomach is fragile. (Consume it uncooked, mashed, or combined with butter) (Ali 1995).

Anticancer activity:-
Powolny and Singh (2008) examined a number of studies and came to the conclusion that organosulfur compounds, such DAS, DADS, and DATS, work by stopping the growth cycle of

malignant cells. This is corroborated by data from Omar and Al-Wabel (2009) and Miroddi et al. (2011), which demonstrate how these allyl derivatives function as antioxidants and stop the cell cycle. Powolny and Singh (2008) determined that DATS had the most significant role, while Wang et al. (2010) revealed that it may even be a molecule that fights skin cancer. Garlic particularly reduces inflammation by changing cytokines and NF-kB activity in the tissues around it (Keiss et al. 2003) Pl. Dirsch et al. (1998) discovered that ajoene induced apoptosis in malignant cells but not in healthy ones in a study utilizing human promyelocytic leukemia cells; this finding may have been related to the generation of peroxide. Jastrzebski et al. (2007) discovered that raw garlic had the highest antioxidant activity in an in-vitro investigation with rats. Garlic consumption and the existence of malignant cells were found to be inversely correlated by Tsai et al. (2011), who evaluated studies involving animals and cells. This suggests that garlic may have anticancer properties.

May potentially help prevent cognitive decline. It may also enhance learning and memory retention (Borek 2006). According to Aggarwal et al. (2004), garlic may also have anti- inflammatory properties that

Cardioprotective activity:-

Garlic is a widely used supplement that is seen as beneficial for those who want to improve their cardiovascular health. Approximately 4% of all cardiovascular illness and 30% cardiovascular patient who utilize herbal supplements take garlic. Known risk factors for cardiovascular disease include inflammation, high cholesterol, high homocysteine, high blood pressure, diabetes and dementia, including its most frequent form. Alzheimer disease. Indeed, a number of studies have noted the positive effects on the cardiovascular system as early as the 1920s and 1930s (Schlesinger 1926). It is commonly known that garlic can scavenge oxidants, raise levels of glutathione, catalase, superoxide dismutase, and glutathione peroxidase, as well as decrease inflammatory prostaglandins and lipid peroxidation. Garlic also inhibits 3- hydroxy-3-methylglutaryl-CoA, which lowers the synthesis of cholesterol. It has been demonstrated that garlic inhibits homocysteine, platelet aggregation, arterial plaque development, LDL oxidation, blood pressure, and microcirculation—all of which are critical in diabetes since microvascular alterations exacerbate heart disease and dementia. dangers. By shielding neurons from ischemia or reperfusion-related neuronal death and apoptosis, garlic inhibit the nuclear factor-kappa B activation pathway (Aggarwal et al.2004)

Alzheimer's Disease protective activity:-

Aged garlic has been investigated for a variety of benefits that some researchers believe may address a number of underlying mechanisms which lead to the classic Alzheimer beta-amyloid plaque. It is well known for its neuroprotective qualities in vitro (Peng et al. 2002). Garlic, which is a "natural statin," "natural NSAID," "natural anti-oxidant," "natural anti-apoptotic agent," and "memory enhancer," among other single-ingredient synthetic pharmaceutical drugs currently used for Alzheimer's therapy, "is expected to produce cumulative benefits and exhibit enhanced neuroprotection," according to one author (Chauhan 2006). Sadly, clinical research examining the relationship between aged garlic extract and Alzheimer's disease is scarce, with the exception of findings demonstrating enhanced behavior in mice treated with garlic that had reached accelerated senescence. (Nishiyama and colleagues, 2001). Garlic appears like a wise choice for preventive and treatment, given its numerous mechanistic potential and low risk profile. It could be better to use old garlic because it has been examined in relation to Alzheimer's disease the most.

Dosage:-

A commercial garlic product has to supply a minimum of 4000 mg of fresh garlic per day, or one to two cloves. For palatability, chop the cloves and combine them with wildflower honey. According to Murray et al. (2006), this dosage corresponds to at least 10 mg of alliin or a potential 4000 ug of allicin. This would be equivalent to taking 7.2 g of aged garlic extract or 300 mg of garlic powder tablets (standardized to 1.3 percent alliin or 0.6 percent allicin yield) two to three times a day in dry form (Tattelman 2005). 40 drops, up to six times a day, of a fresh bulb tincture made from a 1:2 ratio in 95% alcohol is the recommended dosage.

1. Essential garlic cloves- 2-4g/day, minced garlic clove- 1g
2. Dired-600-900mg daily
3. Infusion-4g in 150ml of water/ day
4. Fluid extract-1:54 ml/day

Oil-0.03-0.12 ml/day

Garlic supplements:- 1.Essential oil (Garlic oil) Dehydrated powder (Garlic powder) 3.Pills

4. Oil macerate
5. Extract

Drug Interactions: -
If you take any of the medications listed below, consult your doctor before using any garlic supplements.

1. **Antiplatelet medications: -**
(Garlic may exacerbate the effects of drugs that prevent the body's platelets), such as:
- Aspirin
- Dipyridamole
- Indomethacin

2. **Blood-thinning medications: -**
(Excessive amounts of fresh or commercially prepared garlic may increase bleeding risk) such as:
- Aspirin
- Warfarin

3. **Sulfonylureas:-**
A class of diabetes drugs (because garlic can significantly drop blood sugar, blood sugar levels should be continuously watched and observed when using garlic in conjunction with these medications) Including:
- Chlorpropamide
- Glimepiride
- Glyburide.

4. **Protease inhibitors:-**
These drugs are used to treat HIV-positive individuals. Garlic may lower blood levels of protease inhibitors. Examples of these drugs include:
- Indinavir
- Ritonavir
- Saquinavir

5. **Statins:-**
A class of drugs that decrease cholesterol; are two examples of these drugs (garlic may act similarly to statins).
- Atorvastatin
- Lovastatin

6. **ACE Inhibitors :-**
ACE a class of drugs that lower blood pressure (it is advised not to combine significant amounts of garlic with any of these drugs because it may behave similarly to ACE inhibitors) that includes:
- Captopril
- Enalapril
- Lisinopril

Adverse effects:-
Garlic has valuable medicinal properties may also act toxically when overdosed. It commonly associated with garlic intake is breath odor. The herb are used nausea and vomiting are other major adverse effects and care should be taken in consuming high quantities. Although an entire bulb produce little juice. It is potent and can act as a strong emetic even in small quantities. Although garlic generally little term of safety issue, there are isolated cases of topical garlic burns and anaphylaxis. There were several reported allergic conjunctivitis, urticaria, anaphylaxis.

Internally adverse effects:-
-Bloating
-Bad breath
-Upset stomach
-Body odor
-Headache
-Fatigue
-Vertigo

Externally adverse effects:-
Handling an excessive amount of fresh or dried garlic can hurt the skin, which can lead to blistering if applied to sensitive skin. It can also cause contact dermatitis, or skin rash, to emerge. Garlic should not be used by humans since it thins the blood.
- With bleeding disorders such as:-
  Hemophilia
  Platelet aggregation
- To much garlic can increase your risk for bleeding during or after:- Delivery a baby
  Undergoing surgery

Cautions: -
- Asthma patients should not consume garlic as it may have side effects.
- Garlic should be avoided before surgeries or medical operations.
- Do not consume more than 2-3 garlic cloves in a day without consulting a doctor.
- Diabetes patients consume garlic it make blood sugar levels are too low.

CONCLUSION:
Allium sativum is a multifaceted plant, garlic is a gilding from creation to humans as the description above emphasizes. A single clove of garlic has the power to treat a multitude of aliments by inhibiting

the growth of numerous bacteria, fungus, harmful viruses, insects and worms. Garlic is still a potent antibacterial agent today, even in the face of ever growing resistant pathogens. Allium sativum plant is abundant in several substance that contain flavonoids and phytoconstituents, such as ajoene, alliin and allicin. The biological activities of allium sativum including its antibacterial, antiviral, antifungal and antioxidant properties has been assessed in relation to its extract and isolated chemicals. It is anticipated that some physicians will prescribe garlic as a treatment for specific illnesses if pharmaceutical industry experts can be formulate it as a stable treatment based on scientific results from numerous studies and research aimed at elucidating the plants numerous therapeutic qualities.

REFERENCES: -

1. Yudharaj P, Shankar M, Sowjanya R, Sireesha B, Ashok Naik E, Jasmine P R. Importance and Uses of Medicinal Plants – An Overview. Inter-national Journal of Preclinical and Pharmaceutical Research 2016; 7 (2): 67-73.
2. Tapsell LC, Hemphill I, Cobiac L. Health benefits of herbs and spic-es: the past, the present, the future. Med. J. Aust 2006; 185 (4): S4- 24.
3. Ahn K. The worldwide trend of using botanical drugs and strategies for developing global drugs. BMB Reports 2017; 50 (3): 111-116.
4. http://www.globalherbalsupplies.com/herb_information/garlic.htm.
5. Salunkhe D K, Kadam S S, Eds. 1998. Handbook of Vegetable Science and Technology: Production, Composition, Storage, and Processing. Marcel Dekker. p. 397.
6. Rosen C, Roger B, Vince F, Bill H, Jim P, Cindy T. et al. Growing garlic in Minnesota. University of Minnesota Extension 2016.
7. Nutrition facts for raw garlic, USDA National Nutrient Database, version SR-21. Condé Nast. 2014.
8. Zhang Y, Liu X, Rua J, Zhuang X, Zhang X, Li Z. Phytochemicals of garlic: Promising candidates for cancer therapy. Biomed. Pharma-cother 2020: 123, 109730.
9. Mikaili P, Maadirad S, Moloudizargari M, Aghajanshakeri Sh, Sarahroodi S. Therapeutic Uses and Pharmacological Properties of Garlic, Shallot, and Their Biologically Active Compounds. Iran J Basic Med Sci. 2013; 16:1031-1048.
10. Amagase H. Clarifying the real bioactive constituents of garlic. Journal of Nutrition. 2006; 136:716S-725S.
11. Pendbhaje IS, Amit P, Shahin M, Pathan S, Raotole A, Pattewar SV. Ethno-pharmacology, Pharmacognosy and Phytochemical Profile of Allium Sativum L. A Review. Pharmacology online. 2000; 2:845-85.
12. Jung YM, Lee SH, Lee DS, You MJ, Chung IK, Cheon WH. et al. Fermented garlic protects diabetic, obese mice when fed a high-fat diet by anti-oxidant effects. Nutrients Res. 2000; (5):387-96.
13. Caporaso N, Smith SM Ing RHK. Antifungal activity in human urine and serum after injection of garlic. Antimicrobial Agents Chemotherapy. 1983; 23:700-2.
14. Josling P. Preventing the common cold with a garlic supplement: a double-blind, placebo-controlled survey. Adv. Ther. 2001; 18:189-193.
15. Sabitha P, Adhikari PM, Shenoy SM. Efficacy of garlic paste in oral candidiasis. Trop Doct. 2005; 35(2):99-100.
16. Lemar KM, Miguel AA, Sonia C, Brian O, Carsten TM, David L. Diallyl disulfide depletes glutathione in Candida albicans: oxidative stress mediated cell death studied by two- photon microscopy. Yeast. 2007; 24(8):695-706.
17. Eidi A, Eidi M, Esmaeili E. Antidiabetic effect of garlic (Allium sativum L.) in normal and streptozotocin-induced diabetic rats. Phytomedicine. 2006; 13(9-10):624-9.
18. Zhang XH, Lowe D, Giles P, Fell S, Connock MJ, Maslin DJ. Gender may affect the action of garlic oil on plasma cholesterol and glucose levels of normal subjects. J Nutr. 2001; 131:1471-1478.
19. Silagy CA, Neil HA. A meta-analysis of the effect of garlic on blood pressure. J Hypertension. 1994; 12:463-8.
20. Peng Q, Buzzard AR, Lau BH. Neuroprotective effect of garlic compounds in amyloid-beta peptide-induced apoptosis in vitro. Med Sci Monit. 2002; 8(8):BR328-37.
21. Chauhan NB. Effect of aged garlic extract on APP processing and tau phosphorylation in Alzheimer's transgenic model Tg2576.J Ethnopharmacology. 2006; 108(3):385-94.
22. Murray M, Pizzorno J. (Murray and Pizzorno eds.) Allium sativum (Garlic) in The Textbook of Natural Medicine, Churchill Livingstone Elsevier, St. Louis, 3rd edition, 2006, 734.
23. Tattelman E. Health effects of garlic. Am Fam Physician. 2005; 72(1):103-6.

24. Friedman T, Shalom A, Westreich M. Self-inflicted garlic burns: our experience and literature review. Int. J. Dermatol. 2006; 45(10):1161-1163.
25. Yin J Li H. Anaphylaxis Caused by Younger Garlic. J. Allergy Clin. Immunol. 2007; 119(1):34.