

The Significance of Garlic (*Allium sativum*) on the Livelihood of the Local Community

Worku AW* and Mehari AB

Department of Agriculture and Environmental Sciences, Deber Tabor University, Deber Tabor, Ethiopia

Abstract

Allium sativum, frequently recognized call garlic, is a type in the onion genus, *Allium*. Its seal connections comprise the onion. It is vegetative propagated from clove. The two widespread subspecies are firm collar and squashy collar garlic. It contains diverse helpful raw resources, vitamins, sulfur compounds, amino acids and frequent additional substance second-hand for physical condition of human beings. Sulfur-containing compound are oil soluble and water soluble. *Allicin*, most active an Oily, to some amount yellow water that give garlic its only one of its sort smell. When fresh garlic is chopping or packed down, the enzyme *alinase* converts *alliin* in to *allicin*. *Alliin* is the good number overflowing sulfur composite.

Keywords: *Allium sativum*; Garlic

Introduction

Natural crop of flora and fauna, vegetation and microbial source contain be second-hand by gentleman for thousands of years either in the pure forms or crude extracts to treat many diseases. Garlic (*Allium sativum*) is one of person's vegetation that were gravely investigate in excess of more than a few years and old for centuries to brawl communicable disease [1]. It has been worn for medicinal and as spiritual purpose in the region of the earth. Garlic contains enzymes, minerals and sulfur compound, which are accountable for its overpowering odor and loads of its therapeutic personal property.

Garlic has long been used both for flavoring and for potential benefits of preventing and curing ailments in many cultures. Sulfur hold compound establish in garlic have enough money the person corpse defense by inspiring the manufacture of convinced advantageous enzymes [2]. Scientists are interested in the potential of the organo-sulfur compounds derived from garlic to prevent and extravagance constant disease example cancer and cardiovascular disease [3]. It addition inferior blood cholesterol and blood darling, prevent blood clot, and hold anti-tumor property not in attendance of the loads of medicinal vegetation, garlic is supplementary winning with smallest amount plane property as compare to profitable antibiotics. It has an antimicrobial material goods which protect the crowd from extra pathogens and highlighting the significance of investigate for expected antimicrobial drugs [4-5]. *Allicin*, the most active organo-sulfur compound, was primary inaccessible and premeditated in the trial [6]. It exhibits antibacterial, antifungal, antiviral and antiprotozoal activity [7]. *Allicin* is garlic's protection instrument alongside attack by pests. It also has adverse effects like bad breath, sweat smell and in some people allergy due to allyl methyl sulfide (AMS) and toxicology.

Origin and distribution

Garlic is single of the majority very old educated herb and is vegetative propagate as of cloves. By means of a times gone by of person make utilize of in excess of 7,000 years, garlic is resident to middle Asia. It has extended be a clip in the Mediterranean area, as well as a recurrent excitement in Asia, Africa, and Europe and was recognized to very old Egyptians which has been second-hand for in cooperation cooking and therapeutic reason [8]. Earth garlic farming was greater than previous from 771,000 ha of land in 1989/90 to 1,204,711 ha of land in 2007 with whole manufacture from 6.5 million to 15.68 million tons, and output on or after 8.43 t/ha and 13.02 t/ha [9]. It is full-grown internationally,

but China is the largest consumer and producer with approximately 20 million tones grown yearly, secretarial for over 81% of world output. India 4.6% and South Korea 1.4% follow with Egypt 1.2% on fourth place and the United States in ninth place 0.8% [10]. This vegetation 11% of worldwide garlic manufacture in country that every produces a smaller amount than 2% of universal amount produced. A large amount of the garlic manufacture in the United States is centered in Gilroy, California, which calls itself the "garlic capital of the world". Garlic is the succeeding nearly all extensively sophisticated *Allium* genus in Ethiopia next to onion. Adet, Ambo, Debre-work, and numerous other areas of Ethiopian high ground bring into being the mass of garlic under the little scale farmers division. The sum region beneath garlic manufacture in 2006/07 reached 9,266 hectares and the manufacture is predictable to be in excess of 683,000 quintals. According to Ethiopian Seed Enterprise seed marketing study indicated difference between demand and supply. The potential size of the certified seed market in the country ranges from 0.75 to 1.0 million quintals per year, while the current size of the penetrated market is about 0.2 million quintals per year. Clearly this shows the formal seed sector cannot ensure farmers easy access to seeds of improved varieties P [11]. Currently, the share of the formal seed system is estimated to be about 10-20% while the rest 80-90% is covered by the informal system. The production of cash crop like garlic, onion and additional spice is prove to be proceeds generate for farmers, in particular for folks who encompass cultivated in limited lands or minute possessor farmers.

Varieties

Garlic's close relatives include the Onion (*Allium cepa*), Shallot (*Allium ascalonicum*), Leek (*Allium porrum*), and Chive (*Allium schoenoprasum*). The taxonomic hierarchy of garlic is: Kingdom Plantae, Sub-kingdom Viridiplntae, Super-division Embryophyta, Division

*Corresponding author: Worku AW, Department of Agriculture and Environmental Sciences, Deber Tabor University, Deber Tabor, P.O. Box 272, Ethiopia, Tel: +251 913-986518; E-mail: Melese1980@gmail.com.

Received December 21, 2017; Accepted January 18, 2018; Published January 25, 2018

Citation: Worku AW, Mehari AB (2018) The Significance of Garlic (*Allium sativum*) on the Livelihood of the Local Community. J Food Ind Microbiol 4: 123. doi:10.4172/2572-4134.1000123

Copyright: © 2018 Worku AW, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Tracheophyta, Sub-division Spermatophytina, Class Magnoliopsida, Super-order Lillanae, Order Asparagales, Family Amaryllidaceae, Genus *Allium*, and Species *Allium sativum* [12]. A *sativum* grow in the undomesticated in area where it has turn out to be accept. British wild garlic be associate of the class A. ursinum and the field garlic as *Allium oleraceum*. In North America, *Allium vineale* known as wild or crow garlic and *Allium canadense*. Only of the largest part exceptional predictable garlic is monster garlic, is in point of fact a untamed leek, *Allium. ampeloprasum*, and not true garlic [13] in attendance are two species of *Allium sativum*, ten chief group of variety, and hundreds of assortment or cultivars. *Allium sativum* varieties called ophioscorodon or unbending necked garlic; characterized by hard, woody central stalks that extend down to the basal laminate at the bottom of the bulb and *sativum* varieties are thought to have evolved from hard neck garlic. Soft neck has no woody psedostem formed from overlapping leaf sheaths and rarely sends up a flower stalk.

Constituents of Garlic

Chemical composition of garlic

Garlic enclose vitamins A, B1 and C as well as fiber and water. Garlic has a highly developed incorporation of sulfur compound than several other *Allium* species. Sulfur containing compounds are classified as oil soluble and water soluble. Oil soluble sulphur containing compounds include sulfide; such as daily trisulfied, and allyl methyl trisulfied, dithiins and ajoene. Water soluble compounds include cysteine derivatives such as S-allyl cysteine (SAC), S-allyl mercapto cystine (SAMC) and S-methyl cysteine and gamma-glutamyl cysteine derivatives. Oil soluble sulfur compounds are odorous, whereas water soluble compounds are odorless, colorless, more stable and safer than oil soluble.

Allicin is an greasy, somewhat yellow fluid that give garlic its only one of its kind scent. It is a thioester of sulfenic acid and is as well recognized as allyl thiosulfinate [14] at what time fresh garlic is chop or crushed, the enzyme *alinase* converts *alliin* into *allicin*, which is accountable for the aroma of clean garlic [15]. The *allicin* generated is very unstable and quickly changes into series of other sulfur contain compound such as diallyl disulfides and this break down occurs within hours at room hotness and inside notes throughout food preparation [16]. *Allicin* decomposes in stomach acids to release diallyl sulphide and diallyl disulphide [17] in the most abundant sulfur compound in garlic is *alliin* (S-allylcysteine sulfoxide), which is present at 10 mg/g in unsullied and 30 mg/g in dry garlic. It is primary odourless, and a precursor of *allicin* [18].

Nutritional value of raw garlic

In the representative plateful amount of 1-3 cloves or 3-9 g, garlic provides no momentous dietary value with the comfortable of all indispensable nutrients less 10% of the each day value, when spoken per 100 g; garlic contain a quantity of nutrients in rich amount (USDA Nutrient Database) (Table 1).

Importance of Garlic

Culinary uses (something related to food or cooking)

Garlic is in the middle of the majority significant bulb plant which is second-hand as excitement and flavor agent for foods [19]. It is a basic component in a lot of or the majority dishes of a variety of Countries in the earth counting Ethiopia; used for prepare foods, chiefly a number of kind of stew and in manufacture dehydrated food

Nutritional value per 100 g	
Energy	623 kJ (149 k cal)
Carbohydrates	33.06 g
Sugars	1 g
Dietary fiber	2.1 g
Protein	6.36 g
Vitamins	
Thiamine (B1)	0.2 mg (17%)
Riboflavin (B2)	0.11 mg (9%)
Niacin (B3)	0.7 mg (5%)
Pantothenic acid (B5)	0.596 mg (12%)
Vitamin B6	1.235 g (95%)
Folate (B9)	3 ug (1%)
Vitamin C	31.2 mg (38%)
Minerals	
Calcium	181 mg (18%)
Iron	1.7 mg (3%)
Magnesium	25 mg (7%)
Manganese	1.672 mg (80%)
Phosphorus	153 mg (22%)
Potassium	401 mg (9%)
Sodium	17 mg (10%)
Zinc	1.16 mg (12%)

Source: USDA Nutrient Database.

Table 1: Nutritional value of raw garlic per 100 g Nutrition.

for storage. The savor varies in concentration and aroma with the far removed from food preparation method. It is over and over again balancing with onion, tomato, or ginger, and be also taken raw, boiled or mixing with honey, meat, cheese, butter and with milk or with coffee. Garlic the length of with cinnamons is used as fish and beef additive, and display antimicrobial material goods at temperature as high as 120°C; the amalgamation can also be second-hand to safeguard fried and cavernous fried food [20]. Garlic plant's bulb is the largest part on a regular basis worn part, which is divided into numerous fleshy sections call cloves, and are second-hand for consumption as raw or cooked and for medicinal purpose. It has a trait strong, spicy flavor that mellows and sweetens significantly with cooking [21]. The foliage and plants are also eat. They are milder in taste than the bulbs and are often consumed while immature and still tender [22]. The immature flower stalks of the firm neck and elephant types are sometimes marketed for uses comparable to asparagus in stir-fries. The flimsy, protective layers of skin over various parts of the plant and the roots emotionally involved to the bulb are the only parts not considered palatable [23]. Garlic powder has a dissimilar flavor from clean garlic. If second-hand as a substitute for fresh garlic, 1/8 tea spoon of garlic fine particles is equivalent to one clove of dirt free garlic.

The green, dry "folds" in the center of the garlic clove are especially pungent, is cause by chemical answer that occurs when the garlic cells are broken. The flavor is most intense shortly after cutting or chopping. This substance reaction cannot occur after garlic is fit for human consumption. This is why roasted garlic is sweet rather than pungent. The odor can be reduced by sucking or ingesting lemon juice, chewing roasted coffee, raw cereal and Tena adam (*Ruta chalensis*) after the conception of garlic wash the top with entertainment in instalments is 8. Only a partial and imperfect answer to the tang. Studies have exposed sipping milk at the identical time as unbearable garlic can appreciably neutralize bad breath. Mixing garlic with make the most of in the mouth to the lead of swallowing reduced the odor better than drinking milk after that. Plain water, mushroom and basil may also

reduce the odor; the mix of fat and water found in milk, though, was the good number helpful [24]. To use garlic; peel with a knife or on the other hand, split the skin from the individual cloves by placing a clove with the smooth side down on a cutting board and soothingly tapping it with the horizontal side of a wide knife. You can then remove the skin either with your fingers or with a small knife. If there is a green sprout in the clove's center, gently remove it since it is difficult to digest. We recommend using raw garlic in many of our recipes. If it is a cooked dish, it needs to prepare and add raw, chopped garlic towards the end of the cooking time to retain maximum flavor and nourishment. According to investigator at the nationwide Cance Institute, garlic should be chop and allowable to sit for 10-15 minutes before cooking to stabilize practical compounds and make best use of garlic's anti-cancer properties [25].

Microwave cooking of unpeeled, uncrushed garlic totally destroyed *allinase* enzyme activity [26]. Nationally, garlic is stock up warm on top of 18°C (64°F) and dry to keep it inactive. It is traditionally hung; soft neck varieties are often braided in strand call plaits or grippes. Peeled cloves may be store in wine or vinegar in the refrigerator. Commercially, garlic is stored at 0°C (32°F), in dry low dampness surroundings. It will be kept longer if the tops stay behind attached.

Medicinal value of garlic

Therapeutic garlic come in many forms, but underdone garlic is the most potent and deodorize forms may have concentrated curative action. The untimely Egyptians used garlic to treat diarrhoea and its medicinal rule was described on the fortifications of ancient temples and on papyrus date to 1500 BC. "Let food be thy medicine and medicine be thy food" Those are famous words from the ancient Greek physician Hippocrates, often called the father of western medicine. He actually used to prescribe garlic to treat a variety of medical condition. It prevent free generation and support body protective mechanism that destroy free of charge radical and some form of growth, heart illness, strokes and viral infections. It was used as an antiseptic to put off gangrene during World War I and II.

The bulb is pasted with honey or butter or the juice is used to paste other plant remedies (powders) in the treatment of malaria, eczema, snake bite, mitat, emaciation, swellings back pain, evil eye and hemorrhoids. Because of its high level of *allicin* effectively treat hair loss.

Benefits of garlic: The majority lately, a twofold blind gesture forbidden study has exposed noteworthy defense from the widespread cold virus. As conducted by the garlic centre, published in Advance in therapy, this is the opening somber work to show anticipation, treatment and reduction of re infection reimbursement from intriguing Allimax powder capsules once a day. An additional being revise was conduct with and unprocessed garlic take out (5 to 10 g/day) which was known to HIV/AIDS patients. Antibacterial activity: Louis Pasteur [27] provided the first modern scientific evidences on medicinal and antibacterial use of garlic extract. Garlic take out inhibit the enlargement of oral pathogens, concretely *Streptococcus mutant*, *S. sobrinus* and *Porphyromonas gingivalis*, *Prevotella intermedia* consider as the main bacteria responsible for dental caries and adult periodontitis [28-29]. Pest control: Garlic makes an excellent economical nontoxic pesticide for the garden. It has natural fungicidal and pesticides properties that work effectively to control pests. For maximum efficacy for pest control, avoid using any chemical fertilizers. Fertilizers diminish the capacity of vital ingredients in garlic to fight pests. Aphids, ants, termites, white flies, beetles, borers, caterpillars, slugs and armyworms are some of the pests that can be suitable controlled using garlic. So business have

in make use of its pest-repelling property a step supplementary by disentanglement its energetic complex and advertising them in a spray-on modus operandi or over and over again full-fledged in the midst of plants or root vegetables as a accompanying person plant, with the aim of protecting other plants from pests. In some little garden plot, row of garlic are plant along the perimeter to act as a deterrent. The extract are freeze-dried and market as garlic pellet, which are then dissolve in water and sprayed onto vegetation to deter aphids and caterpillars. Garlic water is simple to make and easy administer. It can be used on vegetable or flowering plants.

Holy and religious use of garlic

Garlic has been regard as energy for both good and evil. In Europe, numerous background have second-hand garlic for fortification or white magic, perhaps owing to its reputation as a potent preventative medicine. Central European folk beliefs well thought-out garlic a powerful ward against imp, werewolves, and vampires. To ward off vampires, garlic could be worn, hung in window, or rub on chimneys and keyholes [30]. In Islam, it is forbidden for Muslims who have eat raw garlic to appeal in a mosque; since the whiff could absorb other Muslims during their prayer, In the Philippine folklore garlic is used to force away monsters. Garlic scares away vampires, obviously magical, it protect against both physical and psychic vampirism. It is lengthily old in the Wiccan faith for jewellery and spell that supplement rapidity, power, staying power, defense, and to repel evil. Solider have over and in excess of another time accepted it in to battle for these reason. Putting clove under a child's pillow while its sleeps is believed to protect it from evil. Wiping a blade with unmarked garlic fruit drink can empower the knife to be used alongside dark forces. It is over and over another time said to contain aphrodisiac power.

Adverse effects and toxicology

Garlic is recognized for cause ghastly inhalation (halitosis), as in good health as cause be concerned to enclose a pungent "garlicky" smell [31] which is cause by ally methyl sulfide (AMS). Ally methyl sulfide is a unstable fluid which is engrossed into the blood throughout the metabolism of garlic consequential sulfur compound; on or after the blood it travels to the lungs and on or after there to the oral cavity, reason bad breath; (Garlic breath) and hide, where it is exude through skin pores.

The surface belongings of long-standing garlic addition are for the most part unidentified, and no food and drug administration approved learning has been performing. Credible side belongings comprise gastrointestinal discomfort, sweating, dizziness, allergic reactions, bleeding, and menstrual irregularities [32]. Some breastfeeding mothers have found, after consuming garlic, that their offspring be able to be sluggish to nourish, and contain renowned a garlic odor impending from them [33]. If elder than not required doses of garlic are in make use of with anticoagulant medication, this can demonstrate the way to a high danger of hemorrhage [34]. Garlic may act together with Warfarin, Antiplatelets, Saquinavir, Antihypertensive, Calcium channel blockers, Quinolone relations of antibiotics example Ciprofloxacin, and Hypoglycemic drugs, as well as additional medication. Excess doses of garlic can cause toxicity, including anemia and gastrointestinal problems. High doses of garlic powder (200 mg/kg) caused considerable cell injury in rat liver which was not observed at lower doses [35]. The toxic effects of garlic may be appreciably reduced at lower concentrations. Oral dosages recommended to promote health in adults are 4 g (1-2 cloves) of raw garlic per day, one-300 mg dried garlic tablet (standardized to 1-3% *alliin* or 0.6% *allicin*) [36].

Conclusion

Garlic (*Allium sativum*) is in the middle of the most significant bulb vegetable which is old as spice and flavor agent for foods and is a fundamental component in many or most dishes of an assortment of country in the earth counting Ethiopia. Clove is the most normally used part; foliage and plants are also sometimes eaten [37-43]. The flavor varies in intensity and aroma with the different cooking methods. It is frequently balancing with onion, tomato, or ginger and be hypothetical to be in use raw, boiled or mixing with honey, meat, cheese, butter and with milk or with coffee. It should be chopped and allowable to sit for 10-15 minutes before cooking to stabilize beneficial compounds. Garlic has been second-hand for centuries to fight communicable diseases and varieties of non-infectious disease including pest control mechanism [44-53]. It has natural fungicidal and pesticides properties. It has antimicrobial action alongside many species of microorganisms, viruses, parasites, protozoan and also lower blood weight, prevent blood clot, contains anti-tumor properties, increase the dissimilar to scheme to brawl off possible sickness, reduce stress, and discontinue some form of cancer, caress and viral infection [54-62]. It is damaged in the deed of malaria, eczema; snake bite, swellings back pain, and hemorrhoids. Garlic has also spiritual and religious use. It protect against physical and psychic vampirism. Despite its importance it has adverse effects like pungent smell, reflected in both breath and body odours, allergic reaction might cause burn and contact dermatitis, and may interact with anti-clotting drugs [63-69].

References

- Gebreyohannes G, Gebreyohannes M (2013) Medicinal Value of Garlic. Department of Biology, Faculty of Veterinary Medicine. International Journal of Medicine and Medical Science 5: 401-408.
- Mansell P, Reckless J (1991) Effects on serum lipids, blood pressure, coagulation, platelet aggregation and vasodilation. BMJ 303:379-380.
- Tapiero H, Townsend DH, Tew KD (2004) Organo sulfur compounds from alliaceae in the Prevention of human pathologies. Biomed Pharmacotherapy 58: 183-193.
- Bajpal M, Pande A, Tewari SK, Prakash D (2005) Phenolic contents and antioxidant activity of some food and medicinal plants. Int J Food Sci Nutr 56: 287-291.
- Wojdylo A, Oszmianski J, Czemerz R (2007) Antioxidant activity and phenolic compound in 32 selected herbs. Food Chem 105: 940-949.
- Block E (2010) Garlic and Other Alliums: The Lore and the Science. Royal Society of Chemistry.
- Salama AA, Aboulaila M, Terkawi MA, Mousa A (2014) Inhibitor effect of allicin on the growth of Babesia and Theileria equiparasites. Parasitological Research 113: 275-283.
- Simonetti G (1990) Simon and Schuster's Guide to Herbs and Spices. Simon and Schuster.
- FAO (2007) Area and production of crops by Countries.
- ERS (2006) United States Department of Agriculture Vegetables and Melons Outlook, the except Commodity Highlight: Garlic at way back Machine.
- Yonas S, Belay S, Zewdie B (2008) The farmer-based seed production and marketing Scheme.
- Plants database (2000) National Plant Data Center, NRCS, USDA Baton Rouge.
- Zohary D, Hopf M (2000) Domestication of plant in the Old World.
- Nikolic V, Stankovi M, Nikolic LJ, Cvetkonics D (2004) Mechanism and kinetics of synthesis of allicin pharmacie 59: 10-4.
- Kouroundaki PN, Rekka EA (1991) Effect on active oxygen species of alliin and Allium sativum (garlic) powder. Research Commun Chemistry Pathology Pharmacology 74: 249-252.
- Blania G, Spangenberg B (1991) Formation of allicin from dried garlic, Alliumsativum: a simple HPTLC method for simultaneous determination of allicin and ajoene indried garli and garlic preparations. Planta Med 57: 371-375.
- Mohamed B ,Salah A, Abd Allah B, Mohamoued (2003) Metaboli and Histological Studies on the effectof Garlic administration on the Carnivorous fish chryichthy auratus.Zoology Department Faculty of Science, Assiut University Egypt. Journal of Biology 5: 94-107.
- Stoll A, Seebeck E (1948) Allium compounds Alliin the true mother compound of garlic oil. Helv Chim Acta 31: 189-210.
- Velisk J, Kubec R, Davidek J (1997) Chemical composition and classification of culinary and pharmaceutical garlic-based products 204: 161-164.
- Ranjan S, Dasgupta N, Saha P (2012) Comparative Study of Antimicrobial activity of Garlic and Cinnamon at different temperature: and its application on preservation of fish. Advance Application Science Research 3: 495-501.
- Katzer G (2009) Garlic Retrieved December 2, 2012.
- Thompson S (1995) The Kitchen Garden Bantam Books.
- Kero J (2010) Survey and Serological identification of viruses infecting garlic in Ethiopia M.Sc. Thesis Addis Ababa University, Ethiopia.
- BBC News (2010) Drinking a glass of milk can stop Garlic.
- Lawrence AZ (2003) Nutrition watch: Chop and stop-give garlic arrest. Eating well.
- Songng K, Milner JA (2001) The Influence of heating on the anticancer properties of garlic. Journal of Nutrition 131: 1054s-1057s.
- Pasteur L (1858) Memoire sur la fermentation apple lactique. Annali di chemica et physica 52: 404-418.
- Bakri IM, Douglas CWI (2005) Inhibitory effect of garlic extracts on oral bacteria Archives of Oral Biology 50: 645-651.
- Groppo FC, Romacciato JC, Motta RHL, Ferraresi PM, Sartoratto A (2007) Antimicrobial activity of garlic against oral Streptococci. International Journal of Dental Hygiene 5: 109-115.
- Pickering D (2003) Cassel's Dictionary of Superstitions. Sterling publishing.
- Borrelli F, Capasor R, Izzo AA (2007) Garlic :Adverse effects and drug Interaction in humans.Molecular Nutrition Food Res .
- Medicinal Use of Garlic (2009) Access Date February 20, 2016.
- Hogg, Jennifer (2002) Garlic Supplements Complementary Medicines Summary. Medicine Information National Health Service. Using Garlic as a Natural pesticide by Susan. Patterson
- Brown DG, Wilkerson EC, Love WE (2015) A Review of traditional and novel oral anticoagulant and antiplatelet therapy for dermatologists and dermatologic surgeons Journal of the American Academy of Dermatology 72:524-34.
- Didry N, Dubreuil L, Pinkas M (1992) Antimicrobial activity of naphthaquinones and Alliumextracts combined with antibiotics. Pharmacology Acta Helv. 67:148-151.
- Tattelman E (2005) Health effect of garlic American Family Physician.
- Benavides GA, Squadrito GL, Mills RW, Patel HD, Isbell TS et al., (2007) Hydrogen sulfide mediates the vasoactivity of garlic. PNAS.Antimicrobial Effect of Tenegn Honey and Garlic against Standard and Clinical Pathogenic Bacterial Isolates. International Journal of Micro biological Research 4: 16-2.
- Bordia A (1981) Effect of garlic on blood lipids in patients with coronary heart disease. Journal of Clinical Nutrition 34: 2100-2103.
- Cavallito, Chester J, Bailey, John Hays (1944) Allicin, the antibacterial principle of Allium sativum Isolation, physical properties and Antibacterial Action. Journal of the American Chemical Society 66: 1950-1951.
- City of Gilroy Community profile.
- Eidi A, Eidi M, Esmaeili E (2006) Antidiabetic effect of garlic in normal and streptozotocin-induced diabetic rat. Phytomed 13: 624-629.
- ESE (2000) Annual Report Ethiopian Seed Enterprise. Addis .
- Fekadu M, Gandena G (2006) FAO. Food security in Ethiopia, Agriculture and consumer protection Department Review of the status of vegetable crops production and marketing in Ethiopia. Uganda Journal of Agricultural Science 12: 26-30.

44. Garlic Agronomy. Access Date January, 2016.
45. Garlic History Access Date February 16, 2016.
46. Garlic Access Date October, 22, 2014.
47. Garty BZ (1993) Garlic burns Pediatrics 9: 658-659.
48. Hadith-The Book of Mosques and place of and teaching of prophet horizontal tab character.
49. Health benefits of garlic, who-know beauty uses, and hidden home repairs. Acces Date February 17, 2016.
50. The natural repellent nature of garlic. Access. Date February 21, 2016.
51. Raj RK (1975) Screening of indigenous plants for anthelmintic action against human *Ascaris lumbricoides*. Indian Journal of Physiology Pharmacology 19: 47-49.
52. Koda Y, Suzuki A, Imada F, Kasuga S, Sumioka I, Kanezawa A (2002) Physical, Chemical and Biological properties of S-allylcystein an amino acid derived from garlic. Journal of Agricultural Food Chem 50: 622-632.
53. Ledezma E, Castro RA (2006) Ajoene the main active component of garlic a new antifungal agent. Rev Iberoam Mycology 23:75-80.
54. Mc Mahon FG, Vargas R (1993) Can garlic lower blood pressure? A pilot study, Pharmacotherapy 13: 406-407.
55. Michael Ohlsson (1998) The Buddhist Diet. SFSU.
56. MoARD Crop Variety Register.
57. Tadele MAS, Selvaraj T (2014) White rot. An aggressi pest of onion and garlic in Ethiopia. Department of Plant Science.Ambo University, Ethiopia. Journal of Agricultural Biotechnology and Sustainable Development 6: 6-15.
58. Morihara N, Ushijima M, Kashimoto N, Sumioka I, Hayama H (2006) Aged garlic extract ameliorates physical fatigue. Biol. Pharm. Bull 29: 962-966.
59. Ohaeri OC (2001) Effect of garlic oil on the levels of various enzymes in the serum and tissue of streptozotocin diabtci rats. Bioscience Rep 21:19-24.
60. Breath, plasma or simulated gastric fluids. Journal of Nutrition 131: 9685-9715.
61. Sabayan B, Foroughinia F,Chohedry A (2006) A postulated role of garlic organosulfur compounds in prevention of valproic acid hepatotoxicity. Med. Hypotheses 65: 12-514.
62. Shyam Ghahfarokhi M, Shokoohamiri MR (2006).In vitro antifungal activities of *Allium cepa*, *Allium sativum*, and Ketoconzol against some pathogenic yeasts and dermatophytes. Fitoterapia 77: 321-323.
63. Silagy CA, Neil HA (1994) Meta-analysis of the effect of garlic on blood pressure.
64. Survey: Prevalence of use and reports of adverse events Am. Diet Association 106: 1966-1974.
65. Tattlement EMD (2005) Health effect of garlic American Family Physician 72: 103-106.
66. Timb BB, Ross MP, Mc Carthy PV, Lin CT (2006) Dietary supplements in a national survey: prevalence of use and reports of adverse events. Am.Diet. Assoc 106: 1966-1974.
67. Tsai Y, Cole LL, Davis LE, Lockwood SJ ,Simmons V, Wild GC (1985) Antiviral Properties of garlic: In Vitro effects on influenza B, herpes simplex and coxsackiviruses.
68. Tsao SM ,Yin MC (2001) In vitro antimicrobial activity of four diallyl sulphides occurring Journal of Medical Microbiology 50: 646-649.
69. Tucker, Arthur O, Thomas De Baggio (2000) The big book of herbs: a comprehensive illustrated reference to herbs of flavor and fragrance. USDA. Nutrient Database.