

Garlic (*Allium sativum*);

In a study in 23 adults with warts caused by human papillomavirus (HPV), applying garlic extract to affected areas twice daily eliminated the warts in all of them after 1–2 weeks[21]. Additionally, older test-tube studies note that garlic may have antiviral activity against influenza A and B, HIV, HSV-1, viral pneumonia, and rhinovirus, which causes the common cold. However, current research is lacking[22]

Animal and test-tube studies indicate that garlic enhances immune system response by stimulating protective immune cells, which may safeguard against viral infections[23]

Ancient History:

The leading surviving medical text, Charaka-Samhita, recommends garlic for the treatment of heart disease and arthritis 2000 years ago[1]. A later manuscript, dating to ~300 AD, advanced the use of garlic for infections, infestations and worms, weakness and fatigue, and a variety of digestive disturbances. This text, nearly as old as the Charaka-Samhita, is known as the Bower manuscript because, after being found in an ancient tomb, it was purchased by a British Army officer, Hamilton Bower, late in the 19th century, who then made it available to scholars. Garlic was also observed to have a diuretic effect. It is possible that the mobilization of fluid from the extravascular space may have been due to improved cardiovascular function resulting from garlic treatment. It is now well recognized that garlic, appropriately used, will reduce blood pressure[2], improve elevated serum cholesterol [4] decrease platelet aggregation[4] and protect vascular endothelial cells from damage by LDL[6]; all of these effects are of potential cardiac benefit.

Garlic was classified as a “hot food” to be consumed during the winter to limit the development of pulmonary or breathing disorders [6]. Garlic was also utilized against massive debilitation and later in the Great Plagues [7].

A leading physician of the 16th Century, Pietro Mattioli of Siena, wrote widely, and his work was translated into several other languages. He prescribed garlic for digestive disorders, infestations with worms and renal disorders, as well as to help mothers during difficult childbirth [6]. In England, Doctors carried cloves of garlic with them at all times to protect themselves from the odor of disease[6]. The Home Book of Health, authored by John Gunn in 1878, featured garlic prominently; it was recommended as a diuretic, for treatment of infections, as a general tonic and for asthma and other pulmonary disorders[6]. In the early part of the 20th century, in the volume Health Remedies, a Complete Medical Work and Family Guide, garlic was promoted for diseases of the lung in children and adults. The authoritative medical text of the era was the Codex Ebers [7,8] which consisted of a number of volumes. The Codex also prescribed garlic for circulatory ailments, general malaise and infestations with insects and parasites. Talmud, a Jewish religious text dating from the 2nd century AD, prescribes patterns of behavior, including the consumption of garlic for the treatment of infection with parasites and other disorders[6]. Hippocrates, widely regarded as the father of Medicine, made garlic a part of his therapeutic armamentarium, advocating its use for pulmonary complaints, as a cleansing or purgative agent, and for abdominal growths, particularly uterine[6]. The leading medical authority was the Greek, Dioscorides[7,9], who served as the chief physician for Nero’s army. He was the author of a five-volume treatise that recommended garlic because it “cleans the arteries.” It should be noted that the circulation of the blood was not discovered until hundreds of years later, and contemporary beliefs held that arteries transported air throughout the body, whereas veins were known to transport blood. Clearly, the concept that cardiovascular status may be improved by garlic, presently a subject of active research, has origins in antiquity.

Medicine in Rome was greatly influenced by the writings of Pliny the Elder, a Greek physician who wrote the five-volume *Historia Naturalis*[6,7]. Twenty three uses for garlic were listed for a variety of disorders. Among these was that garlic was believed to confer significant protection against toxins and infections, a finding corroborated by contemporary investigations of the effects of garlic upon activities of P450-2E1 and other hepatic degradative diseases[10,11].

The anti-oxidative effects of garlic have been reported to include enhancement of superoxide dismutase activity [12], a decrease of the serum lipid peroxide level [13], and trapping of hydroxyl radicals [14]. The degree of the anti-oxidative effect is also influenced considerably by differences in the methods used to process garlic [15]. Immunomodulation effects of garlic have been reported to inhibit the decrease of spleen weight and spleen cell number caused by psychological stress [16], to enhance natural killer activity [17], and to suppress contact hypersensitivity [18].

One large, 12-week study found that a daily garlic supplement reduced the number of colds by 63% compared to a placebo[19]. The average length of cold symptoms was also reduced by 70%, from 5 days in the placebo group to just 1.5 days in the garlic group. Another study found that a high dose of aged garlic extract (2.56 grams per day) reduced the number of days sick with cold or flu by 61% [20].

REFERENCES:

- [1] Woodward, P. W. (1996) *Garlic and Friends: The History, Growth and Use of Edible Alliums*, pp. 2–22. Hyland House, Melbourne, Australia.
- [2] Steiner, M., Khan A. H., Holbert, D. & Lin, R.I. (1996) A double-blind crossover study in moderately hypercholesterolemic men that compared the effect of aged garlic extract and placebo administration on blood lipids. *Am. J. Clin. Nutr.* 64: 866–870.
- [3] Riviin, R. S. (1998) Patient with hyperlipidemia who received garlic supplements. *Lipid Management*. Report from the Lipid Education Council 3: 6–7.
- [4] Steiner, M. & Lin R. S. (1998) Changes in platelet function and susceptibility of lipoproteins to oxidation associated with administration of aged garlic extract. *J. Cardiovasc. Pharmacol.* 31: 904–908.
- [5] Ide, N. & Lau, B. H. (1997) Garlic compounds protect vascular endothelial cells from oxidized low density lipoprotein-induced injury. *J. Pharm. Pharmacol.* 49: 908–911.
- [6] Moyers, S. (1996) *Garlic in Health, History and World Cuisine*, pp. 1–36. Suncoast Press, St. Petersburg, FL. Numbers 11:5, The Bible.
- [7] Bergner, P. (1996) *The Healing Power of Garlic*, pp. 3–26. Prima Publishing, Rocklin, CA.
- [8] Lawson, L. D. (1998) Garlic: a review of its medicinal effects and indicated active compounds. In: *Phytomedicines of Europe. Chemistry and Biological Activity*. ACS Symposium Series 691 (Lawson, L. D. & Bauer, R., eds.), pp. 176–209. American Chemical Society, Washington, DC.
- [9] Riddle, J. M. (1996) The medicines of Greco-Roman antiquity as a source of medicines for today. In: *Prospecting for Drugs in Ancient and Medieval European Texts: A Scientific Approach* (Holland, B. K., ed.), pp. 7–17. Harwood Academic Publishers, Amsterdam, The Netherlands.
- [10] Block, E. (1985) The chemistry of garlic and onions. *Sci. Am.* 252: 114–119.
- [11] Pinto J. T. & Rivlin R. S. (1999) Garlic and other allium vegetables in cancer prevention. In: *Nutritional Oncology* (Heber, D., Blackburn, G., and Go, U. L. M., eds.). Academic Press, San Diego, CA. pp. 393–403.
- [12] Geng, Z., Lau, B. H. S., Aged garlic extract modulates glutathione redox cycle and superoxide dismutase activity in vascular endothelial cells, *Phytother. Res.* 1997, 11, 54–56.
- [13] Grune, T., Scherat, T., Behrend, H., Conradi, E. et al., Influence of *Allium sativum* on oxidative stress status a clinical investigation, *Phytomedicine* 1996, 2, 205–207.
- [14] Prasad, K., Laxdal, A. V., Yu, M., Raney, L. B., Evaluation of hydroxyl radical-scavenging property of garlic, *Mol. Cell. Biochem.* 1996, 154, 55–63.
- [15] Imai, J., Ide, N., Nagae, S., Moriguchi, T. et al., Antioxidant and radical scavenging effects of aged garlic extract and its constituents, *Planta Med.* 1994, 60, 417–420.
- [16] Kyo, E., Uda, N., Ushijima, M., Kasuga, S., Itakura, Y., Prevention of psychological stress-induced immune suppression by aged garlic extract, *Phytomedicine* 1999, 6, 325–330.
- [17] Abdullah, T. H., Kirkpatrick, D. V., Carter, J., Enhancement of natural killer cell activity in AIDS with garlic, *J. Oncol.* 1989, 21, 52–53.
- [18] Reeve, V. E., Bosnic, M., Rozinova, E., Boehm-Wilcox, C., A garlic extract protects from ultraviolet B radiation- induced suppression of contact hypersensitivity, *Photochem. Photobiol.* 1983, 58, 813–817.
- [19] Josling P, Preventing the common cold with a garlic supplement: a double-blind, placebo-controlled survey, *Adv Ther.* 2001 Jul-Aug;18(4):189-93. Garlic Centre, Battle, East Sussex, United Kingdom. DOI: 10.1007/bf02850113
- [20] Nantz MP, Rowe CA, Muller CE, Creasy RA, Stanilka JM, Percival SS. Supplementation with aged garlic extract improves both NK and $\gamma\delta$ -T cell function and reduces the severity of cold and flu symptoms: a randomized, double-blind, placebo-controlled nutrition intervention, *Clin Nutr.* 2012 Jun;31(3):337-44. doi: 10.1016/j.clnu.2011.11.019. Epub 2012 Jan 24.
- [21] Michelle M. Lipke, MPAS, PA-C, An Armamentarium of Wart Treatments, *Clin Med Res.* 2006 Dec; 4(4): 273–293. doi: 10.3121/cmr.4.4.273 PMID: 17210977

[22] Leyla Bayan,Peir Hossain Koulivand,and Ali Gorji,Garlic: a review of potential therapeutic effects,Avicenna J Phytomed. 2014 Jan-Feb; 4(1): 1–14.PMCID: PMC4103721,PMID: 25050296

[23] Rodrigo Arreola,Saray Quintero-Fabián,et.al.,Immunomodulation and Anti-Inflammatory Effects of Garlic Compounds,J Immunol Res. 2015; 2015: 401630. Published online 2015 Apr 19. doi: 10.1155/2015/401630,PMCID: PMC4417560,PMID: 25961060