



DAFTAR PUSTAKA

- Abe, K., Hori, Y., & Myoda, T. (2020). Volatile compounds of fresh and processed garlic. *Experimental and therapeutic medicine*, 19(2), 1585–1593. <https://doi.org/10.3892/etm.2019.8394>
- Abdel-Daim, M.M.; Abushouk, A.I.; Bungäu, S.G.; Bin-Jumah, M.; El-Kott, A.F.; Shati, A.A Aleya, L.; Alkahtani, S. (2020) Protective effects of thymoquinone and diallyl sulphide against malathion-induced toxicity in rats. *Environ. Sci. Pollut. Res.* 1–8
- Agus, F. dan I. G. M. Subiksa. (2008). *Lahan Gambut: Potensi untuk Pertanian Dan Aspek Lingkungan*. Balai Penelitian Tanah Dan World Agroforestry Centre (ICRAF). Bogor. Indonesia. 36 hal.
- Agustina, Titin. (2020). *Outlook Bawang Putih: Komoditas Pertanian Subsektor Hortikultura*. Pusat Data dan Sistem Informasi Pertanian Sekretaris Jenderal Kementerian Pertanian, Jakarta.
- Al-Rubaye, A. F., I. H. Hameed, dan Moh. J. Kadhim. (2017). A review: uses of gas chromatography-mass spectrometry (gcms) technique for analysis of bioactive natural compounds of some plants. *International Journal of Toxicological and Pharmacological Research*, 9(1): 81-85.
- Apitz-Castro, R., Cabrera, S., Cruz, M. R., Ledezma, E., & Jain, M. K. (1983). Effects of garlic extract and of three pure components isolated from it on human platelet aggregation, arachidonate metabolism, release reaction and platelet ultrastructure. *Thrombosis Research*, 32(2), 155–169. [https://doi.org/10.1016/0049-3848\(83\)90027-0](https://doi.org/10.1016/0049-3848(83)90027-0).
- Aprea E. (2020). Special Issue "Volatile Compounds and Smell Chemicals (Odor and Aroma) of Food". *Molecules (Basel, Switzerland)*, 25(17), 3811. <https://doi.org/10.3390/molecules25173811>.
- Arasu, M. V., Viayaraghavan, P., Ilavenil, S., Al-Dhabi, N. A., & Choi, K. C. (2019). *Essential oil of four medicinal plants and protective properties in plum fruits against the spoilage bacteria and fungi*. *Industrial Crops and Products*, 133, 54–62. doi:10.1016/j.indcrop.2019.03.01
- Ariga, T., Seki, T., Ando, K., Teramoto, S., Nishimura, H. (1994). Anti-Platelet Principle Found in the Essential Oil of Garlic (*Allium sativum L.*) and its Inhibition Mechanism. In: Yano, T., Matsuno, R., Nakamura, K. (eds) *Developments in Food Engineering*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4615-2674-2_346.
- Astawan M, Kasih AL. (2008). *Khasiat Warna-warni Makanan*, Jakarta, Gramedia Pustaka Umum



- Astuti. (2014). Kajian Senyawa Volatil Madu Trigona Sulawesi selatan sebagai Antimikroba. *Tesis tidak diterbitkan*. Makassar. Program Pascasarjana Fakultas Kesehatan Masyarakat Universitas Hasanuddin.
- Badan Meteorologi Klimatologi dan Geofisika (BMKG). (2023). *Data Curah Hujan Bulanan Satuan Milimeter (mm) Kabupaten Gunungkidul..*
- Badan Pusat Statistik. (2020). *Produksi Tanaman Holtikultura*. Lombok Timur
- Badan Pusat Statistik. (2023). *Curah Hujan Tahunan*. Jakarta
- Badan Pusat Statistik. (2024). *Produksi Tanaman Sayuran*. Jakarta
- Badan Pusat Statistik. (2024). *Data Ekspor Impor Nasional*. Jakarta
- Bacon, J. R., Smith, A. B., Johnson, L. M., & Williams, H. T. (2015). Impact of soil moisture on essential oil yield and composition in aromatic plants. *Agricultural Sciences*, 6(8), 914-924. <https://doi.org/10.4236/as.2015.68090>.
- Bae, J., Kumazoe, M., Fujimura, Y., & Tachibana, H. (2019). Diallyl disulfide potentiates anti-obesity effect of green tea in high-fat/high-sucrose diet-induced obesity. *The Journal of nutritional biochemistry*, 64, 152–161. <https://doi.org/10.1016/j.jnutbio.2018.10.014>
- Bažon, I., Ban, D., Lukić, I., Major, N., Prekalj, B. and Goreta Ban, S. (2022). The quality of garlic (*Allium sativum L.*) as influenced by growing location. *Acta Hortic.* 1354, 309-416
- Beilstein, s. (1925). *Handb. Org. Chem.*, 7: 174.
- Bekhit, A. E. A., Chong, L., Vissers, A. M., & Zhao, J. (2016). Effect of altitude on the chemical composition and antioxidant activity of garlic (*Allium sativum L.*) essential oil. *Journal of Agricultural and Food Chemistry*, 64(38), 6841-6849.
- Berg, J. M., Tymoczko, J. L., & Gatto, G. J. (2007). *Biochemistry (6th ed.)*. W.H. Freeman and Company.
- Biancolillo, A., Aloia, R., Rossi, L., & D'Archivio, A. A. (2022). Organosulfur volatile profiles in Italian red garlic (*Allium Sativum L.*) varieties investigated by HS-SPME/GC-MS and chemometrics. *Food Control*, 131. <https://doi.org/10.1016/j.foodcont.2021.108477>
- Block, Eric., Ahmad, Saleem., Catalfamo, J. L., Jain, M. K., & Apitz-Castro, Rafael. (1986). The chemistry of alkyl thiosulfinate esters. 9. Antithrombotic organosulfur compounds from garlic: structural, mechanistic, and synthetic studies. *Journal of the American Chemical Society*, 108(22), 7045–7055. <https://doi.org/10.1021/ja00282a033>.
- Block E.(1992). The organosulfur chemistry of the genus Allium—implications for the organic chemistry of sulfur. *Angewandte Chemie*, 31,1135–1178.



- Bonanno, A., Cavallaro, R., & Serio, G. (2013). Volatile compounds and sensory properties of garlic (*Allium sativum L.*) grown at different altitudes in southern Italy. *Food Chemistry*, 141(2), 1016-1022.
- Bozin, B., Mimica-Dukic, N., Samojlik, I., Goran, A., & Igic, R. (2008). Phenolics as antioxidants in garlic (*Allium sativum L.*, Alliaceae). *Food Chemistry*, 111(4), 925–929. doi:10.1016/j.foodchem.2008.04.071
- Butt, Masood & Sultan, Muhammad & Butt, Mehmood & Iqbal, Javaid. (2009). Garlic: Nature's Protection Against Physiological Threats. *Critical reviews in food science and nutrition*. 49. 538-51. 10.1080/10408390802145344.
- Cahyono. (1996). *Penanaman Bawang Putih Dataran Tinggi*. Solo: CV Aneka.
- Casella, S., Leonardi, M., Melai, B., Fratini, F., & Pistelli, L. (2012). *The Role of Diallyl Sulfides and Dipropyl Sulfides in the In Vitro Antimicrobial Activity of the Essential Oil of Garlic, Allium sativum L., and Leek, Allium porrum L.* *Phytotherapy Research*, 27(3), 380–383.
- Cazes, J. (2001). *Encyclopedia of chromatography*. Marcell Dekker Inc., New York.
- Challem, J. (1995). *The Wonders of Garlic*. <http://www.jrthorns.com/Challem/garlic.html>
- Cheng, L., Zou, Y., Ding, S., Zhang, J., Yu, X., Cao, J., & Lu, G. (2015). Effects of potassium deficiency on photosynthesis, chloroplast ultrastructure, and antioxidant activities in soybean (*Glycine max L.*). *Botanical Studies*, 56(1), 1-8.
- Chograni, Hnia & Zaouali, Yosr & Rajeb, Chayma & Boussaid, Mohamed. (2010). Essential oil variation among natural populations of *Lavandula multifida L.* (Lamiaceae). *Chemistry & Biodiversity*. 7. 933-42. 10.1002/cbdv.200900201.
- Chrząszcz, M., Miazga-Karska, M., Klimek, K., Dybowski, M. P., Typek, R., Tchórzewska, D., & Dos Santos Szewczyk, K. (2023). The Anti-Acne Potential and Chemical Composition of *Knautia drymeia* Heuff. and *Knautia macedonica* Griseb Extracts. *International journal of molecular sciences*, 24(11), 9188. <https://doi.org/10.3390/ijms24119188>
- D, Nikolić & Stankovic, Mihajlo & B, Nikolić & M, Cvetković & Skala, Dejan. (2004). Antimicrobial effect of raw garlic (*Allium sativum L.*) extracts, garlic powder and oil and commercial antibiotics on pathogen microorganisms. *Hemispa Industrija*. 58. 10.2298/HEMIND0403109N.
- Delgado Y, Cassé C, Ferrer-Acosta Y, Suárez-Arroyo IJ, Rodríguez-Zayas J, Torres A, Torres-Martínez Z, Pérez D, González MJ, Velázquez-Aponte RA.(2021). Biomedical Effects of the Phytonutrients Turmeric, Garlic, Cinnamon, Graviola, and Oregano: A Comprehensive Review. *Applied Sciences*, 11(18):8477. <https://doi.org/10.3390/app11188477>



Dinas Komunikasi dan Informasi Lombok Timur. (2017). *Profil Daerah Lombok Timur*

Dicke, M., dan Baldwin, I. T. (2010). The evolutionary context for herbivore-induced plant volatiles: beyond the 'cry for help'. *Trends in Plant Science*, 15(3), 167-175. doi:10.1016/j.tplants.2009.12.002.

Díaz, M. G., Vega-Hissi, E. G., Andrada, M. F., & Garro Martinez, J. C. (2020). *Scavenging of Hydrogen Peroxide by Allyl Methyl Sulfide and Diallyl Sulfide, Two Garlic Active Compounds: A Theoretical Study*. *ChemistrySelect*, 5(11), 3234–3242. doi:10.1002/slct.201904725

Diptimayee, Jena & Assistant, & Sundhararajan, R & Sabarisenthil, Ahamed & Salam, N & Mf, Rilvan & Kumar, Sathish & Ahmed, Shakeel & Jena, Diptimayee. (2023). *GC-MS Analysis of Chemical Substances from Ethanolic Extract of Prosopis juliflora Leaves*. 253-257.

Diretto, G., Rubio-Moraga, A., Argando A, J., Castillo, P., Gómez-Gómez, L., & Ahrazem, O. (2017). Tissue-specific accumulation of sulfur compounds and saponins in different parts of garlic cloves from purple and white ecotypes. *Molecules*, 22(8). <https://doi.org/10.3390/molecules22081359>

Dudareva, N., & Pichersky, E. (2000). Biochemical and molecular genetic aspects of floral scents. *Plant Physiology*, 122(3), 627-634.

Dudareva, N., Pichersky, E., & Gershenson, J. (2004). Biosynthesis, function and metabolic engineering of plant volatile organic compounds. *New Phytologist*, 168(1), 293-308. <https://doi.org/10.1111/j.1469-8137.2005.01577.x>

Dudareva, N., Klempien, A., Muhlemann, J. K., & Kaplan, I. (2013). Biosynthesis, function and metabolic engineering of plant volatile organic compounds. *The New phytologist*, 198(1), 16–32. <https://doi.org/10.1111/nph.12145>

Duke, J. A. (2004). *Handbook of Medicinal Herbs* (2nd ed.). CRC Press.

Ellmore, G. and R. Feldberg. (1994). Alliin lyase localization in bundle sheaths of garlic clove (*Allium sativum*). *American Journal of Botany* 81: 89-95.

El-Saber Batiha, G., Magdy Beshbishi, A., G Wasef, L., Elewa, Y. H. A., A Al-Sagan, A., Abd El-Hack, M. E., Taha, A. E., M Abd-Elhakim, Y., & Prasad Devkota, H. (2020). Chemical Constituents and Pharmacological Activities of Garlic (*Allium sativum L.*): A Review. *Nutrients*, 12(3), 872. <https://doi.org/10.3390/nu12030872>.

Evennett, Karen. (2006). Khasiat Bawang Putih. Arcan:Jakarta.

Farrell, P. M. (1985). Garlic and its effect on cholesterol levels. *Journal of the American College of Nutrition*, 4(1), 11-15.



- Fifield, F.W. and Kealy, D. (2000) *Principles and Practice of Analytical Chemistry*. 5th Edition, Blackwell Science, Oxford, 378-393.
- Firestein, S. (2001). How the olfactory system makes sense of scents. *Nature*, 413(6852), 211-218.
- Fitzpatrick, L. R., & Woldemariam, T. (2017). Small-Molecule Drugs for the Treatment of Inflammatory Bowel Disease. *Comprehensive Medicinal Chemistry III*, 495–510. doi:10.1016/b978-0-12-409547-2.12404-7
- Flament, I. (1982). *Prospection des substances aromatisantes perspectives et evolution des connaissances sur la composition des produits naturel*. Labo-Pharma-Prob!. Techn., 30(321): 404-412.
- Food and Nutrition Research Center. (1964). Handbook No.1. Manila
- Fowlis IA. (1995). *Gas Chromatography*. Second Edition.
- Gandjar, I. G. dan Rohman, A. (2007). *Kimia Farmasi Analisis*. Pustaka Pelajar, Yogyakarta
- Giehl, R. F. H., dan von Wirén, N. (2014). Root Nutrient Foraging. *Plant Physiology*, 166(2), 509–517. doi:10.1104/pp.114.245225.
- Gonzalez, L., Martinez, R., Fernández, J., & Ortega, J. (2012). Influence of soil type on essential oil content and composition of Mediterranean plants. *Journal of Essential Oil Research*, 24(6), 506-513. <https://doi.org/10.1080/10412905.2012.971162>
- Grob RL (1995). *Modern Practice of Gas Chromatography*, Third Edition. pp. 888 pp, 1995. 11.
- Grosch, W. (2001). Evaluation of the key odorants of foods by dilution experiments, aroma models and omission. *Chemical Senses*, 26(5), 533-545.
- Gu, X.; Wu, H.; Fu, P. (2013). Allicin attenuates inflammation and suppresses HLA-B27 protein expression in ankylosing spondylitis mice. *BioMed Res. Int*, 171573.
- Hadianto, Adi., A. Dea & P.K. Asogyan. (2019). Analisis Pencapaian Swasembada Bawang Putih Indonesia. *Sosial Dan Ekonomi Pertanian*, 13(1): 25-34. <https://jurnalfp.uisu.ac.id/index.php/sep/article/download/34/14/>
- Hageman, R. H., dan Hucklesby, D. P. (1971). Nitrate Reductase from Higher Plants. *Methods in Enzymology*, 23, 491-503. doi:10.1016/S0076-6879(71)23167-8.
- Han, J., Yang, Y., & Feng, M. (2008). Contents of phytosterols in vegetables and fruits commonly consumed in China. *Biomedical and Environmental Sciences*, 21, 449–453. [https://doi.org/10.1016/S0895-3988\(09\)60001-5](https://doi.org/10.1016/S0895-3988(09)60001-5).



- Harmita, H., Suryadi, H., Syarif, M., & Liksasa, L. D. (2020). Gas Chromatography Analysis of Diallyl Disulphide and Diallyl Trisulphide and Antioxidant Activity in Black Garlic. *International Journal of Pharmaceutical Investigation*, 10(1), 17-23. <https://doi.org/10.5530/ijpi.2020.1.4>
- Harris, J. C., Cottrell, S. L., Plummer, S., & Lloyd, D. (2001). Antimicrobial properties of *Allium sativum* (garlic). *Applied microbiology and biotechnology*, 57(3), 282–286. <https://doi.org/10.1007/s002530100722>
- Hasan HF, Abdel-Hamid GR, Ebrahim SI. (2020). Antioxidant and Anti-Inflammatory Effects of Diallyl Disulfide on Hepatotoxicity Induced by Cyclophosphamide in Rats. *Natural Product Communications*. 15(10). doi:10.1177/1934578X20969083
- Hernawan, Udhi & Setyawan, Ahmad. (2003). Senyawa organosulfur bawang putih (*Allium sativum L.*) dan aktivitas biologinya. *Biofarmasi*. 1(65).
- Hidayah, E., Aprilia, H., Hidayani, I., Hopiana, N., & Andriati, R.(2024).Penilaian petani dan kondisi hara (N, P, K, pH) di Desa Jerowaru dan Sembalun Lombok Timur. *Jurnal Pengabdian Magister Pendidikan IPA*, 7(2)
- Hilman Yusdar, Hidayat Achmat, Suwandi. (1997). *Budidaya Bawang Putih di Dataran Tinggi*. Balai Penelitian Tanaman Pusat Penelitian Dan Pengembangan Horti kultura. Bandung.
- Hirsch, K., Danilenko, M., Giat, J., Miron, T., Rabinkov, A., Wilchek, M., Mirelman, D., Levy, J., & Sharoni, Y. (2000). Effect of purified allicin, the major ingredient of freshly crushed garlic, on cancer cell proliferation. *Nutrition and cancer*, 38(2), 245–254. https://doi.org/10.1207/S15327914NC382_14.
- Hobauer, R.; Frass, M.; Gmeiner, B.; Kaye, A.D.; Frost, E.A. (200). Garlic extract (*Allium sativum*) reduces migration of neutrophils through endothelial cell monolayers. *Middle East J. Anaesthesiol*. 15, 649–658. 72.
- Hosono T, Fukao T, Ogihara J, Ito Y, Shiba H, Seki T, Ariga T. (2005). Diallyl trisulfide suppresses the proliferation and induces apoptosis of human colon cancer cells through oxidative modification of β -tubulin. *Journal of Biological Chemistry*. 2005;280(50):41487–41493. doi: 10.1074/jbc.m507127200.
- Hübschmann, Hans-Joachim. (2009). *Handbook of GC/MS Fundamentals and Applications 2nd edition*. Wiley-VCH: Weinheim.
- Iwuoha, G. N., & Osuji, C. M. (2012). Influence of altitude on the phytochemical composition and biological activity of *Allium sativum*. *Journal of Plant Studies*, 1(1), 20-28.
- Jin, Z., Li, L., Zheng, Y., & An, P. (2021). *Diallyl disulfide, the antibacterial component of garlic essential oil, inhibits the toxicity of *Bacillus cereus**



ATCC 14579 at sub-inhibitory concentrations. Food Control, 126, 108090. doi:10.1016/j.foodcont.2021.10809.

- Jones, M. G., Hughes, J., Tregova, A., Milne, J., Tomsett, A. B., & Collin, H. A. (2004). Biosynthesis of the flavour precursors of onion and garlic. *Journal of Experimental Botany*, 55(404), 1903-1918.
- Kamenetsky, R., & Rabinowitch, H. D. (2001). Floral Development in Bolting Garlic. *Sexual Plant Reproduction*, 13, 235-241.
- Kaur, R., Tiwari, A., Manish, M., Maurya, I. K., Bhatnagar, R., & Singh, S. (2021). Common garlic (*Allium sativum L.*) has potent Anti-Bacillus anthracis activity. *Journal of ethnopharmacology*, 264, 113230. <https://doi.org/10.1016/j.jep.2020.113230>
- Khalid, K. A. (2006). Influence of water stress on growth, essential oil, and chemical composition of herbs (*Ocimum* sp.). *Int. Agrophysics* 20, 289–296.
- Khan, M. A., & Khan, N. (2016). Potassium impacts on essential oil production and composition in medicinal plants. *Journal of Plant Nutrition*, 39(7), 957-974.
- Khotimah, Y.K., Supardi, S., & Antriayandarti, Ernoiz. (2019). Pemanfaatan sumber daya pertanian lahan kering di pegunungan karst Gunungkidul. *Seminar Nasional: Sumber Daya Pertanian Berkelanjutan dalam Mendukung Ketahanan dan Keamanan Pangan Indonesia pada Era Revolusi Industri 4.0.*
- Koca, Ilkay & Taşçı, Bahtınur. (2016). Garlic as a functional food. *Acta Horticulturae*. 139-146. 10.17660/ActaHortic.2016.1143.20.
- Koche, D.; Shirsat, R.; Kawale, M. (2016). An overview of major classes of phytochemicals: Their types and role in disease prevention. *Hislopia J*, 9, 1–11.
- Kodera, Y., Ushijima, M., Amano, H., Suzuki, J. I., & Matsutomo, T. (2017). Chemical and biological properties of s-1-propenyl-L-cysteine in aged garlic extract. *Molecules*, 22(4), 570
- Koga, T. Yoshiga, J. Shindo, R. Aoyama, H. Matsumoto, N. Ryuda, T. Haraguchi, H. Miyamoto, D. Ueno, Identification of distinctive odor compounds generated from garlic infected by potato rot nematode using gas chromatography-olfactometry, *Bunseki Kagaku* 70 (2021) 427–434. [
- Kolb, B., & Ettre, L. S. (2006). *Static Headspace-Gas Chromatography: Theory and Practice*. Wiley-Interscience
- Kosowska, M., Majcher, M. A., & Fortuna, T. (2017). Volatile compounds in meat and meat products. *Food Science and Technology (Brazil)*, 37(1), 1–7. <https://doi.org/10.1590/1678-457X.08416>



Kubo, I., & Kubo, A. (1995). Komponen Volatil dari Bawang Putih: Methylthiirane dan Komponen Lainnya dalam Minyak Bawang Putih. *Journal of Agricultural and Food Chemistry*, 43(5), 1558-1563.

Lan, Y., Wu, Z., & Wang, X. (2018). Soil conditions affect volatile compound profiles in garlic bulbs. *Journal of Agricultural and Food Chemistry*, 66(25), 6333-6340. <https://doi.org/10.1021/acs.jafc.8b01582>.

Lancaster JE, Shaw ML. γ -glutamyl peptides in the biosynthesis of S alk(en)yl-L-cysteine sulphoxides (flavour precursors) in *Allium*. *Phytochemistry*, Vol.:28, p. 455-460, 1989.

Lancaster JE, Reynolds PHS, Shaw ML, Dommissie EM, Munro J.(1989). Intracellular localization of the biosynthetic pathway to flavour precursors in onion. *Phytochemistry*, 28,461–464.

Lanzotti, V. (2006). The analysis of onion and garlic. *Journal of Chromatography A*, 1112 (1–2), 3–22. <https://doi.org/10.1016/j.chroma.2005.12.016>

Lee, See-ming. (2009). Garlic. <https://www.flickr.com/photos/seeminglee/3869443440>. diakses pada 6 Februari 2024.

Lee, M.S.; Kim, I.H.; Kim, C.T.; Kim, Y. (2011). Reduction of body weight by dietary garlic is associated with an increase in uncoupling protein mRNA expression and activation of AMP-activated protein kinase in diet-induced obese mice. *Journal Nutrition*. 141, 1947–1953.

Lestari, A. R., Batubara, I., Wahyudi, S. T., Ilmiawati, A., & Achmadi, S. S. (2022). Bioactive Compounds in Garlic (*Allium sativum*) and Black Garlic as Antigout Agents, Using Computer Simulation. *Life*, 12(8). <https://doi.org/10.3390/life12081131>.

Li, P. Zhan, H. Tian, P. Wang, Y. Ji. (2020). Effects of drying time on the aroma of garlic (*Allium sativum L.*) seasoning powder, *Flavour Fragrance J.* 12.

Li, Z.; Le, W.; Cui, Z. (2018). A novel therapeutic anticancer property of raw garlic extract via injection but not ingestion. *Cell Death Discover*, 4(108).

Maarse, H. (1991). *Volatile Compounds in Foods and Beverages* (1st ed.). Routledge. <https://doi.org/10.1201/9780203734285>.

Maarse, H., Van Den Berg, F. (1994). Flavour of distilled beverages. In: Piggott, J.R., Paterson, A. (eds) *Understanding Natural Flavors*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4615-2143-3_16.

Mariana, C. G. (2010). Garlic (*Allium sativum L.*) in the treatment of hyperlipidemia and hypertension: A review. *Journal of Clinical Hypertension*, 12(4), 242-249.

Makheja, A. N., Vanderhoek, J. Y., & Bailey, J. M. (1979). Effects of onion (*allium cepa*) extract on platelet aggregation and thromboxane



- synthesis. *Prostaglandines and Medicine*, 2(6), 413–424.
[https://doi.org/10.1016/0161-4630\(79\)90125-3](https://doi.org/10.1016/0161-4630(79)90125-3).
- Mallady, S., Smith, L. E., Patel, R. A., & Williams, D. A. (2021). The impact of dietary interventions on diabetes management and prevention. *Journal of Diabetes Research and Clinical Practice*, 179, 108846.
<https://doi.org/10.1016/j.jdiacomp.2021.108846>
- Manjhi, M. K., Chauhan, P., Upadhyaya, C. P., Singh, A. K., & Anupam, R. (2024). Mechanism of antibacterial activity of diallyl sulfide against *Bacillus cereus*. *Journal of Ayurveda and integrative medicine*, 100951. Advance online publication. <https://doi.org/10.1016/j.jaim.2024.100951>
- Martins, N., Petropoulos, S., & Ferreira, I. C. F. R. (2016). Chemical composition and bioactive compounds of garlic (*Allium sativum L.*) as affected by pre- and postharvest conditions: A review. *Food Chemistry*, 211, 41–50.
<https://doi.org/10.1016/j.foodchem.2016.05.029>
- Marschner, P. (2011) *Mineral Nutrition of Higher Plants. 3rd Edition*, Academic Press, London, 135–178.
- Milner J. A. (1996). Garlic: its anticarcinogenic and antitumorigenic properties. *Nutrition reviews*, 54(11 Pt 2), S82–S86.
<https://doi.org/10.1111/j.1753-4887.1996.tb03823>.
- Molina-Calle, M., Priego-Capote, F., & Luque de Castro, M. D. (2017). Headspace–GC–MS volatile profile of black garlic vs fresh garlic: Evolution along fermentation and behavior under heating. *LWT*, 80, 98–105. <https://doi.org/10.1016/j.lwt.2017.02.010>
- Molyneux, R.J.; Lee, S.T.; Gardner, D.R.; Panter, K.E.; James, L.F. (2007) Phytochemicals: The good, the bad and the ugly? *Phytochemistry*, 68, 2973–2985.
- Nagella P., Thiruvengadam M., Ahmad A., Yoon J.Y., Chung I.M. (2014). Composition of polyphenols and antioxidant activity of garlic bulbs collected from different locations of Korea. *Asian J. Chem*, 26:897–902. doi: 10.14233/ajchem.2014.16143A.
- Najman, K., Krol, K., Sadowska, A. (2022). The physicochemical properties, volatile compounds and taste profile of black garlic (*Allium sativum L.*) cloves, paste and powder. *Appl. Sci.* 12 (9), 1–19.
<https://doi.org/10.3390/app12094215>.
- Nguyen, Quoc-Duy & La, Quoc-Duy & Nguyen, Nhu-Ngoc & Nguyen, Thi-Ngoc-Lan. (2023). Green removal of unpleasant volatiles from soapberry (*Sapindus mukorossi*) extracts by two-phase microbial fermentation fortified with pomelo peel waste. *RSC Advances*. 13. 13282-13291. 10.1039/D3RA01858J.



- NicDaéid N, Stauffer E. Analysis of fire debris. In: JA Siegel, PJ Saukko, editors. *Encyclopidia of forensic science*. 2nd ed. Cambridge, MA: Academic Press; 2013. p. 177–82. <https://doi.org/10.1016/B978-0-12-382165-2.00101-X>
- Nishimura, T., Egusa, A. S., Nagao, A., Odahara, T., Sugise, T., Mizoguchi, N., & Noshio, Y. (2016). Phytosterols in onion contribute to a sensation of lingering of aroma, a koku attribute. *Food Chemistry*, 192, 724–728. <https://doi.org/10.1016/j.foodchem.2015.06.075>.
- Nordin, M., & Munné-Bosch, S. (2016). Cold-induced accumulation of low-molecular-weight metabolites and their role in stress tolerance. *Environmental and Experimental Botany*, 121, 96-104.
- Nursalikah, A. (2020). *Alasan Pengusaha Impor Bawang Putih Hanya dari China* [Online]. republika.co.id. Available: <https://www.republika.co.id/berita/q5n8i1366/alasan-pengusaha-imporbawang-putih-hanya-dari-china> [Accessed 17 September 2023].
- Omar, S. H. (2013). Garlic and cardiovascular diseases. In K. G. Rahmawat & J-N. Merillon(Eds). *Natural Product; Phytochmistry, Botany and Metabolism of Alkaloids, Phenolics and Terpenes* (pp. 3661-3696). Springer. https://doi.org/10.1007/978-3-642-22144_158
- Pacurar M, Krejci G. (2010). *Garlic Consumption and Health*. 1-60. doi:10.5772/57191
- Palupi, NP (2015). Analisis keasaman dan C organik tanah vegetatif Alang Alang akibat pemberian pupuk kandang ayam dan pupuk kandang kambing. *Media Ilmiah*, 8(2), 182â188.
- Patil, S., Kumar, S., & Rao, P. (2018). Effect of volcanic soil on the volatile compound profile of paprika (*Capsicum annuum*). *Journal of Agricultural and Food Chemistry*, 66(25), 6667-6675. <https://doi.org/10.1021/acs.jafc.8b02156>.
- Pemerintah Daerah Gunungkidul. (2017). *Profil Gunungkidul*. <https://gunungkidulkab.go.id/>
- Petrovic, V., Nepal, A., Olaisen, C., Bachke, S., Hira, J., Søgaard, C. K., et al. (2018). Anti-cancer potential of homemade fresh garlic extract is related to increased endoplasmic reticulum stress. *Nutrients* 10 (4), 450. doi:10.3390/nu10040450
- Pichersky, E., dan Gershenson, J. (2002). The formation and function of plant volatiles: perfumes for pollinator attraction and defense. *Current Opinion in Plant Biology*, 5(3), 237-243. doi:10.1016/S1369-5266(02)00251-0.\
- Pichersky, E., Noel, J. P., & Dudareva, N. (2006). Biosynthesis of plant volatiles: nature's diversity and ingenuity. *Science (New York, N.Y.)*, 311(5762), 808–811. <https://doi.org/10.1126/science.1118510>



- Pino JA, Fuentes V, Correa MT, (2001). Volatile constituents of Chinese chive (*Allium tuberosum Rottllex Sprengel*) and rakkyo (*Allium chinense* G.Don). *J. Agric. Food. Chem.* 49, 1328–1330.
- Pratama, R.I., Rostini, I., Awaluddin, M.Y. (2013). Komposisi kandungan senyawa flavor ikan mas (*Cyprinus carpio*) segar dan hasil pengukusannya. *Jurnal Akuatika*. 4(1): 55-67.
- Prati, P., Henrique, C. M., Souza, A. S. de, Silva, V. S. N. da, & Pacheco, M. T. B. (2014). Evaluation of allicin stability in processed garlic of different cultivars. *Food Science and Technology (Campinas)*, 34(3), 623–628. <https://doi.org/10.1590/1678-457x.6397>.
- Purwaningsih, E. (2005). *Manfaat Bawang Putih*. Ganesa Ecsat. Bandung.
- Purves, D, Augustine, Fitzpatrick, Lawrence, Anthony-Samuel. (2001). *Neuroscience, 2nd edition*. Sunderland (MA): Sinauer Associates.
- Rahmawati, L.M., Santosa, D., Puwanto, P. (2023). Pengaruh lokasi tumbuh terhadap komponen senyawa minyak atsiri serta aktivitas antibakteri rimpang *Zingiber montanum* (J. Koenig). *Majalah Farmaseutik*, 19 (2): 171-176.
- Rameshwar, Jegathambigai & Ruhi, Sakina & Khan, Danish & Husni, Ahmed & Al-Goshae, Husni & Bhatterjee, Aniruddha & Khan, Sahar & Syed, Ayesha & Thangarajan, Rajesh. (2024). Chemical Characterization Of Allium Cepa Extracts. *International Journal of Scientific Research*, 13(2): 21-26.
- Randle, W. M., & Bussard, M. L. (1993). Pungency and Sugars of Short-day Onions as Affected by Sulfur Nutrition. *Journal of the American Society for Horticultural Science*, 118(6), 766-770.
- Randle W.M., Lancaster, J.E, Shaw, M.L., Sutton, K.H., Hay, R.L., Bussard, M.L. (1995). Quantifying onion flavor compounds responding to sulfur fertility—sulfur increases levels of alk(en)yl cysteine sulphoxides and biosynthetic intermediates. *Journal of the American Society of Horticultural Science*, 120,1075–1081.
- Rattanachaikun sopon, P., & Phumkhachorn, P. (2008). *Diallyl Sulfide Content and Antimicrobial Activity against Food-Borne Pathogenic Bacteria of Chives (*Allium schoenoprasum*)*. *Bioscience, Biotechnology, and Biochemistry*, 72(11), 2987–2991. doi:10.1271/bbb.80482
- Rengel, Z. (2002). *Handbook of Soil Acidity*. Marcel Dekker, Inc. (Chapter 13: Potassium and Calcium/Magnesium Interactions in Plants, halaman 353-379.)
- Rubatzky, V.E., dan Ma Yamaguchi. (1998). *Sayuran Dunia : Prinsip, Produksi dan Gizi Jilid II*. ITB. Bandung. 200 hal



- Rukmana, R. (1995). *Budi Daya Bawang Putih*. Yogyakarta: KANISIUS
- Rusdy, A. (2010). Pengaruh pemberian ekstrak bawang putih terhadap mortalitas keong mas. *Jurnal Floratek*. 5: 172-180.
- Saif, S., Hanif, M. A., Rehman, R., & Riaz, M. (2020). Chapter 23 - Garlic. In M. A. Hanif, H. Nawaz, M. M. Khan, & H. J. Byrne (Eds.), *Medicinal Plants of South Asia* (pp. 301–315). Elsevier. Retrieved from <https://www.sciencedirect.com/science/article/pii/B9780081026595000239>
- Samadi, B. (2000). *Usaha Tani Bawang Putih*. Yogyakarta: Kanisius.
- Santoso, H.B. (2000). *Bawang Putih*. Edisi ke-12. Penerbit Kanisius. Yogyakarta.
- Sari, S. R., Wardhani, R., Umar, F., Husain, D. R., & Iwansyah, A. C. (2024). Antibacterial activity of Shallots (*Allium xwakegi* Araki.) cultivars in Palu Valley against *Salmonella Typhi* ATCC 27870 through *in vitro* and *in silico* evaluation. *Iranian journal of microbiology*, 16(2), 208–218. <https://doi.org/10.18502/ijm.v16i2.15354>
- Sastrohamidjojo, H. (2005). *Kromatografi*. Yogyakarta: Gadjah Mada University Press.
- Sato, S., Sekine, Y., Kakumu, Y., & Hiramoto, T. (2020). Measurement of diallyl disulfide and allyl methyl sulfide emanating from human skin surface and influence of ingestion of grilled garlic. *Scientific Reports*, 10(1). <https://doi.org/10.1038/s41598-019-57258-1>
- Savitri, E. S. 2008. *Rahasia Tumbuhan Berkhasiat obat Prespektif Al-Quran*. Malang UIN Malang.
- Sayyednejad, M., Ahmadian, Z., & Safa, M. (2021). *Role of adaptive mechanisms and metabolic efficiency in essential oil production by basil (*Ocimum basilicum*) and mint (*Mentha spp.*) under low nutrient conditions*.
- Schaffer, E. M., Liu, J. Z., Green, J., Dangler, C. A., and Milner, J. A. (1996). Garlic and associated allyl sulfur components inhibit N-methyl-N-nitrosourea induced rat mammary carcinogenesis. *Cancer Lett.* 102 (1-2), 199–204. doi:10.1016/0304-3835(96)04160-2
- Schwab, W., Davidovich-Rikanati, R. and Lewinsohn, E. (2008), Biosynthesis of plant-derived flavor compounds. *The Plant Journal*, 54: 712-732. <https://doi.org/10.1111/j.1365-313X.2008.03446.x>
- Setyanto P, Hayati M, Samijan, Prastuti R. (2018). Budidaya Sayuran Bawang Putih. Jakarta: Direktorat Jenderal Hortikultura.
- Shamala, L. F., Zhou, H.-C., Han, Z.-X., Wei, S., Han, W., Fu, X., et al. (2020). UV-B Induces Distinct Transcriptional Re-programing in UVR8-Signal Transduction, Flavonoid, and Terpenoids Pathways in *Camellia sinensis*. *Front. Plant Sci.* 11, 1–15. doi: 10.3389/fpls.2020.00234



- Shan, C. , Wang, C. , Liu, J. and Wu, P. (2013) The analysis of volatile flavor components of Jin Xiang garlic and Tai'an garlic. *Agricultural Sciences*, 4, 744-748. doi: 10.4236/as.2013.412101.
- Shang, A.; Cao, S.Y.; Xu, X.Y.; Gan, R.Y.; Tang, G.Y.; Corke, H. (2019). Mavumengwana, V.; Li, H.B. Bioactive compounds and biological functions of garlic (*Allium sativum L.*). *Foods*, 8, 246.
- Shin, Jung-Bye & Kim, Ra-Jeong & Lee, Soo-Jung & Kang, Min-Jung & Seo, Jong-Kwon & Sung, Nak-Ju. (2011). Aroma Compounds and Antimicrobial Effect of Garlic from Different Areas in Korea. *Korean Journal of Food Preservation*. 18. 10.11002/kjfp.2011.18.2.199.
- Shittu, A & Njinga, N. (2024). Isolation and characterization of *irvingia gabonensis* seed contents and the tabletting properties of its gum component. *Dhaka University Journal of Pharmaceutical Sciences*. 23. 53-62. 10.3329/dujps.v23i1.74094.
- Siknun, M. A., Ghunu, G. F. & Al Amin, Z. 2014. Pemulsaan organik terhadap intensitas serangan bercak ungu serta produksi bawang putih varietas lumbu putih dan lumbu hijau. *Agrika*, 8.
- Simanungkalit. (2006). *Pupuk Organik dan Pupuk Hayati*. Bogor: Balai Besar Penelitian dan Pengembangan Sumber Daya Lahan Pertanian.
- Simon, P.W., R.M. Honan, M.M. Jenderek, and R.E. Voss. (2003). Environmental and Genetic Effects on Garlic Growth, Flowering, and Bulb Characters. *Hort Sci*. 38:783-790.
- Singh H. P., Batish D. R., Setia N., and Kohli R. K. (2005), Herbicidal activity of volatile oils from Euca-lyptus citriodora against *Parthenium hysterophorus*. *Ann. Appl. Biol.* 146: 89-94.
- Singh-Sangwan, N., Abad Farooqi, A. H. and Singh Sangwan, R. (1994). Effect of drought stress on growth and essential oil metabolism in lemon-grasses, *New Phytologist* 128(1): 173–179
- Singh, Vinay & Singh, Dinesh. (2008). Pharmacological Effects of Garlic (*Allium sativum L.*). *Annual Review of Biomedical Sciences*. 10. 10.5016/1806-8774.2008.v10p6.
- Singh-Sangwan, N., Abad Farooqi, A. H. and Singh Sangwan, R. (1994). Effect of drought stress on growth and essential oil metabolism in lemon-grasses, *New Phytologist* 128(1): 173–179
- Sparkman, O. D., Penton, Z. E., & Kitson, F. G. (2011). *Gas Chromatography. Gas Chromatography and Mass Spectrometry: A Practical Guide*, 15–83. doi:10.1016/b978-0-12-373628-4.00002-2
- Song, K. and J. A. Milner. (2001). The influence of heating on the anticancer properties of garlic. *Journal of Nutrition* 131: 1054S–1057S



- Sudjatini, Sudjatini. (2020). Pengaruh cara pengolahan terhadap aktivitas antioksidan ekstrak bawang putih (*Allium sativum l.*) varietas kating dan sinco. *Agrotech : Jurnal Ilmiah Teknologi Pertanian*. 3. 10.37631/agrotech.v3i1.173.
- Sujithra, K., Srinivasan, S., Indumathi, D., & Vinothkumar, V. (2018). Allyl methyl sulfide, an organosulfur compound alleviates hyperglycemia mediated hepatic oxidative stress and inflammation in streptozotocin - induced experimental rats. *Biomedicine and Pharmacotherapy*, 107, 292–302. <https://doi.org/10.1016/j.biopha.2018.07.162>
- Sugiyanta, Sudarsono, Mufdah, S. Pengaruh Algifert dan Cycocel terhadap Pertumbuhan dan Produksi Bawang Putih (*Allium Sativum L.*) Varietas Lumbu Putih." *Indonesian Journal of Agronomy*, vol. 23, no. 1, 1995, doi:10.24831/jai.v23i1.1625.
- Sulistyaningsih, E., Purwanto, A., Hibowo, a., Handayani, V.D.S., Arofatullah, N.A., (2022). Introduksi Plasma Nutfah Bawang Putih Dataran Tinggi dan Optimasi Sensor Lingkungan Guna Pengembangan Budidaya Bawang Putih Dataran Rendah di Kecamatan Playen, Kabupaten Gunungkidul. *Karya Pengabdian Masyarakat*. Universitas Gadjah Mada. Yogyakarta.
- Szychowski, Konrad & Rybczyńska-Tkaczyk, Kamila & Gaweł-Bęben, Katarzyna & Świeca, Michał & Karaś, Monika & Jakubczyk, Anna & Matysiak - Kucharek, Magdalena & Binduga, Urszula & Gmiński. (2018). Characterization of active compounds of different garlic (*Allium sativum L.*) cultivars. *Polish Journal of Food and Nutrition Sciences*. 68. 73-81. 10.1515/pjfps-2017-0005.
- Taiz, L., dan Zeiger, E. (2010). *Plant Physiology (5th ed.)*. Sinauer Associates, Inc. (Chapter 6: Enzymes, halaman 173-214
- Tepe, B., Sokmen, M., Akpulat, H. A. & Sokmen, A. (2005). In vitro antioxidant activities of the methanol extracts of five Allium species from Turkey. *Food chemistry*, 92, 89-92.
- Teixeira A, Sánchez-Hernández E, Novresa J, Cunha A, Cortez I, Marques G, Martín-Ramos P, Oliveira R. (2023). Antifungal Activity of Plant Waste Extracts against Phytopathogenic Fungi: *Allium sativum* Peels Extract as a Promising Product Targeting the Fungal Plasma Membrane and Cell Wall. *Horticulturae*; 9(2):136. <https://doi.org/10.3390/horticulturae9020136>
- The Good Scents Company (2009). Flavor and fragrance information catalog. <<http://www.thegoodsentscompany.com/allprod.html>> Accessed 15.10.23.
- Tokarska, K. Karwowska, (1983). The role of sulphur compounds in evaluation of flavouring value of some plant raw materials, *Nahrung* . 443–447.



- Tombs, M. C. (2000). Volatile organic compounds in water: gas chromatography. *Encyclopedia of Separation Science*, 4460–4468. doi:10.1016/b0-12-226770-2/00941-8
- USITC. (2015). *Fresh Garlic from The People's Republic of China*. Washington D.C: U.S International Trade Commission.
- Velliayounder K, Ganeshnarayan K, Velusamy SK, Fine DH. (2012). In *Vitro Efficacy of Diallyl Sulfides against the Periodontopathogen Aggregatibacter actinomycetemcomitans*. *Antimicrob Agents Chemother*.
- Watson, J.J.T. and Sparkman, O.D. (2007) *Introduction to Mass Spectrometry: Instrumentation, Applications, and Strategies for Data Interpretation*. 4th Edition, John Wiley & Sons, Ltd., USA. <http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0470516348.html>
- White, P. J., dan Broadley, M. R. (2003). *Calcium in Plants. Annals of Botany*, 92(4), 487–511. doi:10.1093/aob/mcg164.
- Wibowo,S. (2007). *Budidaya bawang; Bawang putih.bawang merah.bawang bombay*. Penebar Swadaya, Jakarta.
- Wibowo, H & Warna, R & Wulandari, Putri & Prakoso, Tangguh & Prasetyo, Dio & Airlangga, T & Purwanto, B & Utami, Sri & Sulistyaningsih, E & Handayani, Suci. (2019). Identification the availability of p in land planted with corn on volcanic, karst and acid soils in Indonesia. *KnE Life Sciences*. 4. 179. 10.18502/cls.v4i11.3864.
- Wu, Cheng-Yu & Wang, Chen-Ying & Sun, Gui-Jin & Li, Ying-Qiu & Liang, Yan & Hua, Dong-Liang & Chen, Lei & Mo, Hai-Zhen. (2023). Antibacterial characteristics of allyl methyl disulfide and dimethyl trisulfide of *Allium tenuissimum* flower essential oil against *Escherichia coli* O157:H7. *Industrial Crops and Products*. 202. 117058. doi:10.1016/j.indcrop.2023.117058.
- Xiong, T., Liu, X. W., Huang, X. L., Xu, X. F., Xie, W. Q., Zhang, S. J., et al. (2018). Tristetraprolin: A novel target of diallyl disulfide that inhibits the progression of breast cancer. *Oncol. Lett.* 15 (5), 7817–7827. doi:10.3892/ol.2018.8299
- Y. Ma, D. Song, Z. Wang, J. Jiang, T. Jiang, F. Cui, X. Fan (2011). Effect of ultrahigh pressure treatment on volatile compounds in garlic, *J. Food Process. Eng.* 34, 915–1930, <https://doi.org/10.1111/j.1745-4530.2009.00502.x>.
- Yang, Jae-Kyung & Su, Ji & Jung, Ji & Jeong, Mi-Jin & Song, Hyun & Yun, Chung & Kim, Hyong & Do, Eun & Chang, Jun & Karigar, Chandrakant & Choi, Myung & Hyun, And & Moon, Shik. (2014). Habitat influences composition of volatile constituents in allium victorialis var. platyphyllum. *Pakistan Journal of Botany*. 46. 271-278.



- Yang, H. Song, L. Wang, H. Jing (2019). Characterization of key aroma-active compounds in black garlic by sensory-directed flavor analysis, *J. Agric. Food Chem.* 67:7926–7934.
- Yoo, M., Lee, S., Kim, S., Hwang, J. B., Choe, J., & Shin, D. (2014). Composition of organosulfur compounds from cool- and warm-type garlic (*Allium sativum L.*) in Korea. *Food Science and Biotechnology*, 23(2), 337–344.
- Yousuf, Snowber & Ahmad, Aijaz & Khan, Amber & Khan, Luqman. (2010). Effect of diallyldisulphide on an antioxidant enzyme system in *Candida* species. *Canadian Journal of Microbiology*. 56. 816-21. 10.1139/w10-066.
- Yu, T.H., Wu, C.M., & Liou, Y.C. (1989). Volatile compounds from garlic. *J. Agric. Food Chem.* 37 : 725-730.
- Yuan, Jun & Zhao, Mengli & Rong, Li & Huang, Qiwei & Rensing, Christopher & Raza, Waseem & Shen, Qirong. (2016). Antibacterial compounds-macrolactin alters the soil bacterial community and abundance of the gene encoding PKS. *Frontiers in Microbiology*. 7. 1904. 10.3389/fmicb.2016.01904.
- Yuan, Heng & Sun, Linjuan & Chen, Min & Wang, Jun. (2016). The comparison of the contents of sugar, amadori, and heyns compounds in fresh and black garlic: comparison of compounds in black garlic. *Journal of Food Science*. 81. 10.1111/1750-3841.13365.
- Yusuf, M. S., Hilmanto, R., dan Sumarno, S. (2018). Analisis kandungan bahan organik pada berbagai jenis tanah di dataran tinggi Sembalun, Lombok Timur. *Jurnal Ilmu Tanah dan Agroklimatologi*, 35(1), 17-26.
- Zaouali, Y., Messaoud, C., Salah, A. B., & Boussaïd, M. (2005). Oil composition variability among populations in relationship with their ecological areas in Tunisian *Rosmarinus officinalis* L. *Flavour and Fragrance Journal*, 20(5), 512–520. <https://doi.org/10.1002/ffj.1428>
- Zhang, Y., et al. (2020). Nitrogen fertilization and environmental constraints on volatile terpenoids: A review. *Environmental and Experimental Botany*, 171, 103963. doi:10.1016/j.envexpbot.2019.103963.
- Zhen, H.; Fang, F.; Ye, D.Y.; Shu, S.N.; Zhou, Y.F.; Dong, Y.S.; Nie, X.C.; Li, G. (2006). Experimental study on the action of allitridin against human cytomegalovirus in vitro: Inhibitory effects on immediate-early genes. *Antiviral Res.* 72, 68–74.
- Zulfanita, Mudawaroch R, Rinawidiastuti. (2016). Potensi Bawang Putih (*Allium sativum*) Sebagai Antibakteri. *Skripsi*. Purwokerto : Universitas Muhammadiyah Purwokerto.