

## DAFTAR PUSTAKA

- Abubakar, M. A., Gennadievna, N. E., Mikhailovna, S. O., & Mikhailovna, K. E. (2025). Effect of Induced Polyploidy on Morphology, Antioxidant Activity, and Dissolved Sugars in *Allium cepa* L. *Horticulturae*, *11*(2), 1–14. <https://doi.org/10.3390/horticulturae11020154>
- Ajami, M., & Vazirijavid, R. (2018). Garlic (*Allium sativum* L.). In *Nonvitamin and Nonmineral Nutritional Supplements* (Issue 1). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-812491-8.00033-3>
- Anggraeni, L. (2023). *Chromosome variation and karyomorphology of Artemisia cina O . Berg : Comparison on Colchicine and 2 , 4-D + BA Treatment*.
- Ashraf, S., & Murtaza, G. (2017). Effects of 2, 4-D herbicide on the biochemical characteristics of *Triticum aestivum* L. *Bangladesh Journal of Botany*, *46*(3), 933–938.
- Azmi, Hidayat, I. M., & Wiguna, G. (2011). The Effect of Varieties and Size of Bulbs on Shallot Productivity. *Jurnal Hortikultura*, *21*(3), 206–213.
- Badan Pusat Statistik. (2022). Statistik Hortikultura 2021. *Proceedings of the National Academy of Sciences*, *3*(1), 1–91. <http://dx.doi.org/10.1016/j.bpj.2015.06.056%0Ahttps://academic.oup.com/bioinformatics/article-abstract/34/13/2201/4852827%0Ainternal-pdf://semisupervised-3254828305/semisupervised.ppt%0Ahttp://dx.doi.org/10.1016/j.str.2013.02.005%0Ahttp://dx.doi.org/10.10>
- Badan Pusat Statistik. (2023). Statistik Hortikultura 2023. In *Proceedings of the National Academy of Sciences* (Vol. 3, Issue 1). <http://dx.doi.org/10.1016/j.bpj.2015.06.056%0Ahttps://academic.oup.com/bioinformatics/article-abstract/34/13/2201/4852827%0Ainternal-pdf://semisupervised-3254828305/semisupervised.ppt%0Ahttp://dx.doi.org/10.1016/j.str.2013.02.005%0Ahttp://dx.doi.org/10.10>
- Badan Pusat Statistik. (2025). *Kabupaten Sleman Dalam Angka 2025* (D. Lestanti (ed.); 1st ed., Vol. 49, Issue 1). Badan Pusat Statistik. [http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484\\_SISTEM\\_PEMBETUNGAN\\_TERPUSAT\\_STRATEGI\\_M\\_ELESTARI](http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_M_ELESTARI)
- Baklouti, E., Beulé, T., Nasri, A., Ben Romdhane, A., Drira, R., Doubeau, S., Rival, A., Drira, N., & Fki, L. (2022). 2,4-D induction of somaclonal variations in in vitro grown date palm (*Phoenix dactylifera* L. cv Barhee). *Plant Cell, Tissue and Organ Culture*, *150*(1), 191–205. <https://doi.org/10.1007/s11240-022-02259-8>
- Camadro, E. L., & Peloquin, S. J. (1981). Cross-incompatibility between two sympatric polyploid *Solanum* species. *Theoretical and Applied Genetics*, *60*(2), 65–70. <https://doi.org/10.1007/BF00282417>
- Cartika, I., Suwarni Tri Rahayu, Rofik Sinung Basuki, & Thomas Agoes

- Soetiarso. (2022). Pertumbuhan dan Hasil Tanaman Bawang Putih pada Berbagai Penambahan Lama Penyinaran Lampu LED Putih. *Jurnal Agronomi Indonesia (Indonesian Journal of Agronomy)*, 50(1), 57–64. <https://doi.org/10.24831/jai.v50i1.39300>
- Catalá, C., Rose, J. K. C., & Bennett, A. B. (2000). Auxin-regulated genes encoding cell wall-modifying proteins are expressed during early tomato fruit growth. *Plant Physiology*, 122(2), 527–534. <https://doi.org/10.1104/pp.122.2.527>
- Chen, J. J., Wang, L. Y., Immanen, J., Nieminen, K., Spicer, R., Helariutta, Y., Zhang, J., & He, X. Q. (2019). Differential regulation of auxin and cytokinin during the secondary vascular tissue regeneration in *Populus* trees. *New Phytologist*, 224(1), 188–201. <https://doi.org/10.1111/nph.16019>
- Cheng, Y., Liu, H., Tong, X., Liu, Z., Zhang, X., Jiang, X., & Yu, X. (2021). Somatic embryogenesis and triterpenoid saponin production in *Aralia elata* (Miq.) Seem. *Scientia Horticulturae*, 285(April 2020), 110162. <https://doi.org/10.1016/j.scienta.2021.110162>
- Cheng, Z. H., Zhou, X. J., Khan, M. A., Su, L., & Meng, H. W. (2012). In vitro induction of tetraploid garlic with trifluralin. *Genetics and Molecular Research : GMR*, 11(3), 2620–2628. <https://doi.org/10.4238/2012.July.10.13>
- Czembor, E., Stępień, Ł., & Waškiewicz, A. (2015). Effect of environmental factors on *Fusarium* species and associated mycotoxins in maize grain grown in Poland. *PLoS ONE*, 10(7), 1–18. <https://doi.org/10.1371/journal.pone.0133644>
- Dharmayanti, K., Sulistyarningsih, E., & Wulandari, R. A. (2018). Callus Induction on True Shallot Seed Explant Using a Combination of BA and 2,4-D. *Ilmu Pertanian (Agricultural Science)*, 2(3), 137. <https://doi.org/10.22146/ipas.26276>
- Dhooghe, E., van Laere, K., Eeckhaut, T., Leus, L., & van Huylenbroeck, J. (2011). Mitotic chromosome doubling of plant tissues in vitro. *Plant Cell, Tissue and Organ Culture*, 104(3), 359–373. <https://doi.org/10.1007/s11240-010-9786-5>
- Doaigey, A. R., Al-Whaibi, M. H., Siddiqui, M. H., Al Sahli, A. A., & El-Zaidy, M. E. (2013). Effect of GA3 and 2,4-D foliar application on the anatomy of date palm (*Phoenix dactylifera* L.) seedling leaf. *Saudi Journal of Biological Sciences*, 20(2), 141–147. <https://doi.org/10.1016/j.sjbs.2012.12.001>
- Dustin, P. (1954). Colchicine in agriculture and biochemistry. *Colchicine*.
- Edi, S., Silalahi, B. T., & Gultom, T. (2021). PERBANYAKAN TANAMAN BAWANG PUTIH (*Allium sativum* L.) CV. DOULU GENERASI MV3 DENGAN KULTUR JARINGAN SUMBER EKSPAN BULBIL MENGGUNAKAN NAA (NAPTHELENE ACETIC ACID) DAN BAP (BENZYL AMINO PURINE). *Prosiding Sixth Postgraduate Bio Expo*, 256–275.
- Ermayanti, T. M., Nur Wijayanta, A., & Ratnadewi, D. (2018). Induksi Poliploid pada Tanaman Talas (*Colocasia esculenta* (L.) Schott) Kultivar Kaliurang dengan Perlakuan Kolkisin secara In Vitro (In vitro

- Polyploid Induction on Taro (*Colocasia esculenta* (L.) Schott) Cultivar Kaliurang with Colchicine Treatment). In *Jurnal Biologi Indonesia* (Vol. 14, Issue 1).
- Ernawati, E. (2008). Efek Mutagenik Umbi Kembang Sungsang ( *Gloriosa superba* Lindl .) Terhadap Pembelahan Sel. *J. Sains MIPA*, 14(2), 129–132.
- Fadilla, Z. N., Jurusan, R., Pertanian, B., & Pertanian, F. (2018). INDUKSI POLIPLIIDI PADA BAWANG PUTIH (*Allium sativum* L.) DENGAN PEMBERIAN KOLKISIN POLYPLOID INDUCTION ON GARLIC (*Allium sativum* L.) WITH COLCHICINE. *Jurnal Produksi Tanaman*, 6(5), 783–790.
- Fajaryan Muhammad, C., & Roedy Soelistyono. (2020). The Study on the Impact of Climate Change on the Productivity of Garlic (*Allium sativum* L.) in Malang District. *Jurnal Produksi Tanaman*, 8(9), 886–891.
- Falo, M., Juan, S., Norawati, A., & Kapitan, O. (2016). 237714-Faktor-Faktor-Yang-Mempengaruhi-Produksi-5D72Be11. 1(2502), 84–87.
- Ferreira, M. dos S., Rocha, A. de J., Nascimento, F. dos S., Oliveira, W. D. dos S., Soares, J. M. da S., Rebouças, T. A., Morais Lino, L. S., Haddad, F., Ferreira, C. F., Santos-Serejo, J. A. dos, Fernández, J. S., & Amorim, E. P. (2023). The Role of Somaclonal Variation in Plant Genetic Improvement: A Systematic Review. In *Agronomy* (Vol. 13, Issue 3). MDPI. <https://doi.org/10.3390/agronomy13030730>
- Fras, A., & Maluszynska, J. (2003). Regeneration of diploid and tetraploid plants of *Arabidopsis thaliana* via callus. *Acta Biologica Cracoviensia Series Botanica*, 45(2), 145–152.
- Friska, M., & Daryono, B. S. (2017). Karakter Fenotip Jahe Merah (*Zingiber officinale* Roxb. var *rubrum* Rosc.) Hasil Poliploidisasi dengan Kolkisin. *Al-Kauniah: Jurnal Biologi*, 10(2). <https://doi.org/10.15408/kauniah.v10i2.4813>
- Gultom, T. (2016). 4959-41780-1-PB (1). *Biosains*, 2(3), 165–172.
- Hartati, S., Samanhudi, Cahyono, O., Wibowo, A., Muliawati, E. S., & Andarrini, A. A. (2023). Morphology of hybrid orchid induced by polyploidy using colchicine. *IOP Conference Series: Earth and Environmental Science*, 1133(1). <https://doi.org/10.1088/1755-1315/1133/1/012065>
- Herawati, M. M., Pudjihartati, E., Pramono, S., Sulistyarningsih, E., & Purwantoro, A. (2015). Obtaining *Artemisia cina* polyploidy through plant growth regulator treatment in shoot culture. *Agrivita*, 37(2), 178–184. <https://doi.org/10.17503/Agrivita-2015-37-2-p178-184>
- Hou, S., Rodrigues, O., Liu, Z., Shan, L., & He, P. (2024). Small holes, big impact: Stomata in plant–pathogen–climate epic trifecta. *Molecular Plant*, 17(1), 26–49. <https://doi.org/10.1016/j.molp.2023.11.011>
- Husain, I., Surdaya, T., & Purnomo, S. H. (2022). Induksi Mutasi Menggunakan Kolkisin pada Umbi Bawang Merah (*Allium ascalonicum* L.) Varietas Tajuk. *Jurnal Hortikultura Indonesia*, 13(1), 1–7. <https://doi.org/10.29244/jhi.13.1.1-7>
- Khan, M. A., Hasan, M. K., Miah, M. A. J., Alam, M. M., & Masum, A. S. M. H. (2003). Effect of Plant Spacing on the Growth and Yield of Different

- Varieties of Onion. *Pakistan Journal of Biological Sciences*, 6(18), 1582–1585. <https://doi.org/10.3923/pjbs.2003.1582.1585>
- Le, D., Audenaert, K., & Haesaert, G. (2021). Fusarium basal rot: profile of an increasingly important disease in *Allium* spp. *Tropical Plant Pathology*, 46(3), 241–253. <https://doi.org/10.1007/s40858-021-00421-9>
- Luciani, G. F., Mary, A. K., Pellegrini, C., & Curvetto, N. R. (2006). Effects of explants and growth regulators in garlic callus formation and plant regeneration. *Plant Cell, Tissue and Organ Culture*, 87(2), 139–143. <https://doi.org/10.1007/s11240-006-9148-5>
- Luckett, D. J. (1989). Colchicine mutagenesis is associated with substantial heritable variation in cotton. *Euphytica*, 42(1–2), 177–182. <https://doi.org/10.1007/BF00042630>
- MA Haque, UK Nath, Q. A. (2003). *Effect\_of\_2\_4-D\_and\_BAP\_on\_in\_vitro\_Regeneration\_o.pdf*.
- Mahadi, I., Syafi'i, W., & Sari, Y. (2016). Callus Induction of Calamansi (*Citrus microcarpa*) Using 2,4-D and BAP Hormones by in vitro Methods. *Jurnal Ilmu Pertanian Indonesia*, 21(2), 84–89. <https://doi.org/10.18343/jipi.21.2.84>
- Mangena, P. (2020). Benzyl adenine in plant tissue culture- succinct analysis of the overall influence in soybean [*Glycine max* (L.) Merrill.] seed and shoot culture establishment. *Journal of Biotech Research*, 11, 23–34.
- Meyers, M. (2006). An Herb Society of America Fact Sheet. *Middle East*, 44094(440), 6.
- Moore, C. E., Meacham-Hensold, K., Lemonnier, P., Slattery, R. A., Benjamin, C., Bernacchi, C. J., Lawson, T., & Cavanagh, A. P. (2021). The effect of increasing temperature on crop photosynthesis: From enzymes to ecosystems. *Journal of Experimental Botany*, 72(8), 2822–2844. <https://doi.org/10.1093/jxb/erab090>
- Nagakubo, T., Nagasawa, A., & Ohkawa, H. (1993). Micropropagation of garlic through in vitro bulblet formation. *Plant Cell, Tissue and Organ Culture*, 32(2), 175–183. <https://doi.org/10.1007/BF00029840>
- Najda, A. B., Dyduch, J., & Najda, A. (2011). *YIELDING AND QUALITY OF GARLIC LEAVES. PART II. PRIMARY METABOLITES Comparison of microbial isolates isolated from external ear canal of sheep and their susceptibility to antibiotic View project Vitamin C-role in the body View project YIELDING AND QUALITY OF GARLIC LEAVES. PART II. PRIMARY METABOLITES.* <https://www.researchgate.net/publication/259008068>
- Nicastro, H. L., Ross, S. A., & Milner, J. A. (2015). Garlic and onions: Their cancer prevention properties. *Cancer Prevention Research*, 8(3), 181–189. <https://doi.org/10.1158/1940-6207.CAPR-14-0172>
- Novitasari, A., Damanhuri, D., Adiredjo, A. L., & Soetopo, L. (2023). Induksi Poliploidi Menggunakan Kolkisin pada Tanaman Bawang Putih (*Allium sativum* L.) Varietas Lumbu Kuning dan Lumbu Hijau. *Agro Bali: Agricultural Journal*, 6(3), 648–658. <https://doi.org/10.37637/ab.v6i3.1369>

- Özkul, M., Özel, Ç. A., Yüzbaşıoğlu, D., & Ünal, F. (2016). Does 2,4-dichlorophenoxyacetic acid (2,4-D) induce genotoxic effects in tissue cultured *Allium* roots? *Cytotechnology*, 68(6), 2395–2405. <https://doi.org/10.1007/s10616-016-9956-3>
- Pazmiño, D. M., Romero-Puertas, M. C., & Sandalio, L. M. (2012). Insights into the toxicity mechanism of and cell response to the herbicide 2,4-D in plants. *Plant Signaling and Behavior*, 7(3), 425–427. <https://doi.org/10.4161/psb.19124>
- Perwati, L. K. (2012). Analisis Derajat Ploidi dan Pengaruhnya Terhadap Variasi Ukuran Stomata dan Spora pada *Adiantum raddianum*. *Bioma : Berkala Ilmiah Biologi*, 11(2), 39. <https://doi.org/10.14710/bioma.11.2.39-44>
- Pharmawati, M., Luh, N., Wistiani, A. J., Studi, P., & Biologi, M. (2015). *Induksi Mutasi Kromosom dengan Kolkisin Pada Bawang Putih (*Allium sativum* L.) Kultivar “Kesuna Bali” (Induced Chromosome Mutation Using Colchicine in Garlic (*Allium sativum* Linn.) Cultivar ‘Kesuna Bali’)*.
- Puspita, Y. D., & Erawati, D. N. (2019). KONSENTRASI DAN LAMA PERENDAMAN H<sub>2</sub>SO<sub>4</sub> TERHADAP PERCEPATAN PERKECAMBAHAN BENIH KOPI ARABIKA (*Coffea Arabica* L.) VAR. S795. *Agropross, National Conference Proceedings of Agriculture*, 4(September), 18–19. <https://doi.org/10.25047/agropross.2019.526>
- Qin, Y., Liu, X., Li, C., Chu, Q., Cheng, S., Su, L., Shao, D., Guo, X., He, Z., & Zhou, X. (2023). Effect of light intensity on celery growth and flavonoid synthesis. *Frontiers in Plant Science*, 14(January), 1–12. <https://doi.org/10.3389/fpls.2023.1326218>
- Rosmaiti, & Dani, J. (2015). Pengaruh Konsentrasi dan Lama Perendaman Kolkisin pada Benih Semangka (*Citrullus lanatus* (Thunb. Matsum. et Nankai) Terhadap Keragaan Tanaman. *Jurnal Penelitian Agrosamudra*, 2, 10–18.
- Safina kossier, Parshant Bakshi, Deep Ji Bhat, Amit Jasrotia, T. A. and Q. N. (2022). Ploidy manipulation in fruit crops: A Review. *Indian Journal of Hill Farming*, 35(2), 119–126. <https://doi.org/10.56678/iahf-2022.35.02.17>
- Sandrakirana, R., Fauzia, L., Alami, E. N., Aisyawati, L., Rahmawati, D., Handayati, W., Susanti, I., & Baswarsiat. (2018). Panduan Budidaya Bawang Putih. *Balai Pengkajian Teknologi Pertanian Jawa Timur*, 1–28.
- Sarianti, J., Zulaikha, S., Amaria Wulandari, M., Silva, S., Nuron Rizky, Z., Nurokhman, A., & Yachya, A. (2022). Pengaruh 2,4-Dichlorophenoxyacetic Acid (2,4-D) The Effect Of 2,4-Dichlorophenoxyacetic Acid (2,4-D) And Benzyl Amino Purine (BAP) On Shoot Induction From Folium And Petioulus Communis Exsplants Of Duku Plant (*Lansium domesticum* Corr.). *Stigma*, 15(2), 52–59.
- Setyowati, M., Sulistyarningsih, E., & Purwantoro, A. (2013). 58-76 *INDUKSI POLIPLIODI DENGAN KOLKISINA PADA KULTUR MERISTEM BATANG BAWANG WAKEGI (*Allium x wakegi* Araki)* (Vol. 16, Issue 1).
- Simanjuntak, S., Diana, R. (2018). *Perubahan Keragaman Morfologi*

*Bawang Merah (Allium ascalonicum L.) Akibat Pemberian Kolkisin dan Iradiasi Sinar Gamma. 6(4), 715–721.*

- Sinuraya, F., Roslim, D. I., Deviona, D., & Suharyanto, S. (2023). The Effect of Colchicine Concentration and Immersion Time on Growth and Morphological Characters of *Acacia crassicarpa* A. Cunn. Ex Benth In-vitro Explants. *Jurnal Biologi Tropis*, 23(3), 238–247. <https://doi.org/10.29303/jbt.v23i3.4955>
- Siswadi, E., Putri, S. U., Firgiyanto, R., & Putri, C. F. (2019). Peningkatan Pertumbuhan dan Produksi Bawang Putih (*Allium sativum* L.) melalui aplikasi Vernalisasi dan Pemberian BAP (Benzil Amino Purin). *Agrovigor: Jurnal Agroekoteknologi*, 12(2), 53–58. <https://doi.org/10.21107/agrovigor.v12i2.5419>
- Song, Y. (2014). Insight into the mode of action of 2,4-dichlorophenoxyacetic acid (2,4-D) as an herbicide. *Journal of Integrative Plant Biology*, 56(2), 106–113. <https://doi.org/10.1111/jipb.12131>
- Spencer-Lopes, M. M., Jankuloski, L., Ghanim, M. A., Matijevic, M., & Kodym, A. (2018). Manual on Mutation Breeding Third Edition. In *International Atomic Energy Agency*.
- Sulistyaniingsih, E., Aoyagi, Y., & Tashiro, Y. (2006). Flower bud culture of shallot (*Allium cepa* L. aggregatum group) with cytogenetic analysis of resulting gynogenic plants and somaclones. *Plant Cell, Tissue and Organ Culture*, 86(2), 249–255. <https://doi.org/10.1007/s11240-006-9114-2>
- SUMINAH, S., SUTARNO, S., & SETYAWAN, A. D. (2002). Polyploid induction of *Allium ascalonicum* L. by colchicine. *Biodiversitas Journal of Biological Diversity*, 3(1), 174–180. <https://doi.org/10.13057/biodiv/d030102>
- Teshale, M., & Tekeste, N. (2021). Growth and Yield Response of Garlic (*Allium Sativum* L.) to Intra-row Spacing and Variety at Selekeleka, Northern Ethiopia. *The Open Biotechnology Journal*, 15(1), 1–11. <https://doi.org/10.2174/1874070702115010001>
- Titisari, A., Setyorini, E., Sutriswanto, S., & Suryantini, H. (2019). Kiat Sukses Budi Daya Bawang Putih. In *Pusat Perpustakaan dan Penyebaran Teknologi Pertanian* (Vol. 1, Issue 193).
- Trigiano, R. N., & Gray, D. J. (2004). Plant development and biotechnology. In *Plant Development and Biotechnology*. <https://doi.org/10.5860/choice.42-4023>
- Wang, H., Li, X., Shen, D., Oiu, Y., & Song, J. (2014). Diversity evaluation of morphological traits and allicin content in garlic (*Allium sativum* L.) from China. *Euphytica*, 198(2), 243–254. <https://doi.org/10.1007/s10681-014-1097-1>
- Wassie, W. A., Assegahegn, G. F., Tsegaye, B. A., & Mekonnen, A. B. (2022). Evaluation of Intrarow Spacing on Growth and Yield Performance of Four Onion (*Allium cepa* L.) Varieties in Beyeda District, North Gondar, Ethiopia. *Advances in Agriculture*, 2022. <https://doi.org/10.1155/2022/9408607>
- Wen, Y., Liu, H., Meng, H., Qiao, L., Zhang, G., & Cheng, Z. (2022). In vitro

- Induction and Phenotypic Variations of Autotetraploid Garlic (*Allium sativum* L.) With Dwarfism. *Frontiers in Plant Science*, 13. <https://doi.org/10.3389/fpls.2022.917910>
- Winnie Safira, Fathurrahman, & T. Edy Sabli. (2024). PENGARUH KOLKISIN TERHADAP KARAKTER FENOTIP DAN POLIPLIROIDISASI TANAMAN BAWANG MERAH (*Allium ascalonicum* L.). *Ekoagrotrop*, 2(1), 71–80. <https://doi.org/10.25299/ekoagrotrop.2024.22153>
- Wu, C., Wang, M., Cheng, Z., & Meng, H. (2016). Response of garlic (*Allium sativum* L.) bolting and bulbing to temperature and photoperiod treatments. *Biology Open*, 5(4), 507–518. <https://doi.org/10.1242/bio.016444>
- Wu, J., & Akhmanova, A. (2017). *Microtubule-Organizing Centers*. 51–75.
- Zhao, T., Khatoon, S., Matloob Javed, M., Ghazy, A. H., Al-Doss, A. A., Rauf, M., Khalid, T., Ding, C., & Shah, Z. H. (2024). Delineation of the impacts of varying 6-benzylaminopurine concentrations on physiological, biochemical and genetic traits of different olive cultivars under in vitro conditions. *AoB PLANTS*, 16(4). <https://doi.org/10.1093/aobpla/plae038>
- Zoz, A., Hirata, A. C. S., Scaloppi Júnior, E. J., Borges, W. L. B., de Araújo, T. A. D. N., & de Freitas, R. S. (2025). 2,4-D and glyphosate drift interfere with the growth and initial development of rubber trees. *Bragantia*, 84. <https://doi.org/10.1590/1678-4499.20240151>