DAFTAR PUSTAKA

Ahn, S. Y., Kim, S. A., & Yun, H. K. 2015. Inhibition of Botrytis cinerea and accumulation of stilbene compounds by light-emitting diodes of grapevine leaves and differential expression of defense-related genes. *European journal of plant pathology*, *143*, 753-765.

Aini, Z. Q., Wijayanti, T., & Puspitasari, A. C. 2024. Analisis Efektivitas Kunyit Hitam (*Curcuma caesia* Roxb.) Dalam Penurunan Kadar Mikroalbumin dan Serum Kreatinin Pada Tikus Diabetes Nefropati. *Jurnal Indonesia Sehat*, 3: 79-85.

Alamsjah, F., Anthoni, A., & Tri, WNA 2023. Uji Antibakteri Ekstrak Rimpang Koenih Rimbo (*Curcuma sumatrana* Miq.) Tumbuhan Endemik Sumatra Barat Terhadap Bakteri Gram Positif. *Bioscientist: Jurnal Ilmiah Biologi* 11: 561-570.

Apoorva, Jaiswal, D., Pandey-Rai, S. & Agrawal, S.B. 2021. Untangling the UV-B radiation-induced transcriptional network regulating plant morphogenesis and secondary metabolite production. *Environmental and Experimental Botany*, 192: 104655. https://doi.org/10.1016/j.envexpbot.2021.104655.

Ardiyani, M., Anggara, A., & Leong-Kornickova, J. 2011. Rediscovery of *Curcuma sumatrana* (Zingiberaceae) endemic to West Sumatra. *Blumea-Biodiversity, Evolution and Biogeography of Plants*, 56: 6-9.

Arpita, N.M. 2024. Multiplikasi Tunas *Curcuma sumatrana* Miq. secara *In Vitro* dengan Penambahan Berbagai Konsentrasi 6-Benzylaminopurine (BAP) dan Perak Nitrat ($AgNO_3$). *Skripsi*. Padang: Universitas Andalas.

Asano, N., Kato, A., & Watson, A. A. 2001. Therapeutic applications of sugar-mimicking glycosidase inhibitors. *Mini reviews.* https://doi.org/10.2174/1389557013407052.

Bach, A., Kapczyńska, A., Dziurka, K., & Dziurka, M. 2018. The importance of applied light quality on the process of shoot organogenesis and production of phenolics and carbohydrates in *Lachenalia* sp. cultures in vitro. *South African Journal of Botany*, 114: 14-19.

Bhojwani, S. S., & Dantu, P. K. 2013. *Plant tissue culture: an introductory text.* 318. India: Springer.

Brijesh, H., & Ajjappala, B. 2023. Micropropagation strategies in medicinally important turmeric (*Curcuma* sp): Current research and future challenges. *Journal of Applied Biology and Biotechnology*, *11*: 1-8.

Charles, G., Rossignol, L., & Rossignol, M. 1992. Environmental effects on potato plants in vitro. *Journal of plant physiology*, 139: 708-713. https://doi.org/10.1016/S0176-1617(11)81715-3.

Chen, G. J., Lee, M. S., Lin, M. K., Ko, C. Y., dan Chang, W. T. 2018. Blue light decreases tanshinone IIA content in *Salvia miltiorrhiza* hairy roots via genes regulation. *Journal of Photochemistry and Photobiology B: Biology*, 183: 164-171.

Chen, X. Y., Gao, Z. H., & Ye, S. 2020. Bifunctional N-heterocyclic carbenes derived from l-pyroglutamic acid and their applications in enantioselective organocatalysis. *Accounts of chemical research*, *53*(3), 690-702. https://doi.org/10.1021/acs.accounts.9b00635.

Cousins, M. M., & Adelberg, J. W. 2008. Short-term and long-term time course studies of turmeric (*Curcuma longa* L.) microrhizome development in vitro. *Plant Cell, Tissue and Organ Culture*, 93: 283-293. https://doi.org/10.1007/s11240-008-9375-z.

Das Bhowmik, S. S., Basu, A., & Sahoo, L. 2016. Direct shoot organogenesis from rhizomes of medicinal *Zingiber Alpinia calcarata* Rosc. and evaluation of genetic stability by RAPD and ISSR markers. *Journal of crop science and biotechnology*, 19: 157-165. https://doi.org/10.1007/s12892-015-0119-4.

Dembitsky, V. M., Ermolenko, E., Savidov, N., Gloriozova, T. A., & Poroikov, V. V. 2021. Antiprotozoal and antitumor activity of natural polycyclic endoperoxides: origin, structures and biological activity. *Molecules*, *26*(3), 686. https://doi.org/10.3390/molecules26030686.

Departemen Kesehatan RI, 2017. *Farmakope Herbal Indonesia Edisi V*. Jakarta.

Dewanti, P. 2018. *Teknik Kultur Jaringan Tanaman: Prinsip Umum dan Metode Aplikasi di Bidang Bioteknologi Pertanian*. UPT Percetakan dan Penerbitan Universitas Jember. Jember.

Dixon, R. A., & R. A. Gonzales. 1994. *Plant Cell Culture A Practical Approach. Second Edition*. Oxford University Press. New York.

Dou, H. J., Niu, G. H., Gu, M. M., & Masabni, J. G. 2017. Effects of light quality on growth and phytonutrient accumulation of herbs under controlled environments. *Horticulturae* 3:36. https://doi.org/10.3390/horticulturae3020036.

Dwiyani, R. 2015. *Kultur Jaringan Tumbuhan*. Denpasar : Pelawa Sari.

Elhawary, E.A., Moussa, A.Y. & Singab, A.N.B. 2024. Genus *Curcuma*: chemical and ethnopharmacological role in aging process. *BMC Complementary Medicine and Therapies*, 24: 31. https://doi.org/10.1186/s12906-023-04317-w.

Elmore S. 2007. Apoptosis: a review of programmed cell death. *Toxicol Pathol*. 35(4):495-516.

Fan, X. X., Xu, Z. G., Liu, X. Y., Tang, C. M., Wang, L. W., & Han, X. L. 2013. Effects of light intensity on the growth and leaf development of young tomato plants grown under a combination of red and blue light. *Scientia horticulturae*, 153: 50-55. https://doi.org/10.1016/j.scienta.2013.01.017.

Fazal, H., Abbasi, B. H., Ahmad, N., Ali, S. S., Akbar, F, & Kanwal, F. 2016. Correlation of different spectral lights with biomass accumulation and production of antioxidant secondary metabolites in callus cultures of medicinally important *Prunella vulgaris* L. *Journal of Photochemistry and Photobiology B: Biology*, 159: 1-7.

Folta, K. M., and Carvalho, S. D. 2015. Photoreceptors and control of horticultural plant traits. *HortScience* 50: 1274–1280.

Folta, K. M., and Childers, K. S. 2008. Light as a growth regulator: controlling plant biology with narrow-bandwidth solid-state lighting systems. *HortScience*, *43*(7), 1957-1964. https://doi.org/10.21273/HORTSCI.43.7.1957.

Forde, B. G., & Lea, P. J. 2007. Glutamate in plants: metabolism, regulation, and signalling. *Journal of experimental botany*, *58*(9), 2339-2358. https://doi.org/10.1093/jxb/erm121.

Gharge, S., Hiremath, S.I., Kagawad, P., Jivaje, K., Palled, M.S. & Suryawanshi, S.S. 2021. *Curcuma zedoaria* Rosc (*Zingiberaceae*): a review on its chemical, pharmacological and biological activities. *Future Journal of Pharmaceutical Sciences*, 7: 166. https://doi.org/10.1186/s43094-021-00316-1.

Global Biodiversity Information Facility (GBIF). 2024. *Curcuma sumatrana* Miq. https://www.gbif.org/species/2757531. 12 November 2024.

Gnasekaran, P., Rahman, Z. A., Chew, B. L., Appalasamy, S., Mariappan, V., dan Subramaniam, S. 2021. Development of micropropagation system of *Zingiber officinale* var. rubrum Theilade using different spectrum light-emitting diode (LED) irradiation. *Industrial Crops and Products*, 170:, 113748. https://doi.org/10.1016/j.indcrop.2021.113748.

Guo, Y., Gong, C., Cao, B., Di, T., Xu, X., Dong, J., Zhao, K., Gao, K., dan Su, N. 2023. Blue Light Enhances Health-Promoting Sulforaphane Accumulation in Broccoli (Brassica oleracea var. italica) Sprouts through Inhibiting Salicylic Acid Synthesis. *Plants*, 12(17). https://doi.org/10.3390/plants12173151.

Gupta, S. D., & Jatothu, B. 2013. Fundamentals and applications of light-emitting diodes (LEDs) in in vitro plant growth and morphogenesis. *Plant Biotechnology Reports*, 7(3), 211–220. https://doi.org/10.1007/s11816-013-0277-0

Gupta, S. D., & Karmakar, A. 2017. Machine vision based evaluation of impact of light emitting diodes (LEDs) on shoot regeneration and the effect of spectral quality on phenolic content and antioxidant capacity in Swertia chirata. *Journal of Photochemistry and Photobiology B: Biology*, 174: 162-172. https://doi.org/10.1016/j.jphotobiol.2017.07.029.

Gurav SS, Gurav N, Patil AT, Duragkar NJ. 2020. Effect of eksplant source, culture media, and growth regulators on callogenesis and expression of secondary metabolites of *Curcuma longa*. *Journal Herbs Spices Med Plants*, 26:172-90.

Hamed, M., & Beck, E. 2021. Light spectrum effects on in vitro growth and development of *Curcuma longa*. *Plant Cell, Tissue and Organ Culture*, 147(1), 113–120. https://doi.org/10.1007/s11240-021-02051-2.

Handoyo, T., Pratiwi, H. A., & Munandar, D. E. 2024. Perbedaan Warna Cahaya Lampu LED dan Unsur Molibdenum terhadap Kandungan Antosianin Selada Merah (Lactuca Sativa Var. Crispa). *Agriprima: Journal of Applied Agricultural Sciences*, *8*(1), 1-9.

Hashim, M., Ahmad, B., Drouet, S., Hano, C., Abbasi, B. H., dan Anjum, S. 2021. Comparative effects of different light sources on the production of key secondary metabolites in plants in vitro cultures. *Plants*, 10(8). https://doi.org/10.3390/plants10081521.

Hernández, R., & Kubota, C. 2016. Physiological responses of cucumber seedlings under different blue and red photon flux ratios using LEDs. *Environmental and experimental botany*, 121: 66-74. https://doi.org/10.1016/j.envexpbot.2015.04.001.

Hernández, R., Eguchi, T., Deveci, M., dan Kubota, C. 2016. Tomato seedling physiological responses under different percentages of blue and red photon flux ratios using LEDs and cool white fluorescent lamps. *Scientia Horticulturae*, 213: 270-280. https://doi.org/10.1016/j.scienta.2016.11.005.

Heryanto, R., Zulaeha, Anindya, W., Heliawati, L., Septaningsih, D. A., Karomah, A. H., Trivadila, Rahminiwati, M., Iswantini, D., dan Rafi, M. 2024. Phytochemical Profiling By Lc-Hrms and Antioxidant Activity of *Blumea Balsamifera* Leaves Extract Based on Differences in the Growing Location and Extracting Solvent. *Farmacia*, *72*(3), 613–621. https://doi.org/10.31925/farmacia.2024.3.15

Hew, W. H., Thien, V. Y., Rahman, Z. A., Pang, W. Q., Subramaniam, S., dan Tan, S. T. 2024. Effects of the spectrum of different light-emitting diodes (LEDs) on the morphological and physiological condition of *Kaempferia parviflora* plants. *South African Journal of Botany*, 172: 227-235.

Hogewoning, S. W., Trouwborst, G., Maljaars, H., Poorter, H., van Ieperen, W., dan Harbinson, J. 2010. Blue light dose–responses of leaf photosynthesis, morphology, and chemical composition of Cucumis sativus grown under different combinations of red and blue light. *Journal of experimental botany*, *61*(11), 3107-3117. https://doi.org/10.1093/jxb/erq132.

Huang, Y., Cao, S., Zhang, Q., Zhang, H., Fan, Y., Qiu, F., & Kang, N. 2018. Biological and pharmacological effects of hexahydrocurcumin, a metabolite of curcumin. *Archives of biochemistry and biophysics*, *646*, 31-37. https://doi.org/10.1016/j.abb.2018.03.030.

Hutasuhut, M. A. 2018. Inventarisasi Jenis-Jenis Zingiberaceae di Hutan Telagah Taman Nasional Gunung Leuser Kabupaten Langkat Sumatera Utara. *KLOROFIL: Jurnal Ilmu Biologi dan Terapan*, 2: 14-20.

Idris, S.P. 2024. *In Vitro* Study of *Curcuma sumatrana* Miq. Growth on Modified Murashige and Skoog Media and the Addition of Glutamine. *Bachelor Thesis*. Padang: Universitas Andalas.

Islamadina, R., Can, A., & Rohman, A. 2020. Chemometrics Application for Grouping and Determinating Volatile Compound which related to Antioxidant Activity of Turmeric Essential Oil (*Curcuma longa* L). *Journal of Food and Pharmaceutical Sciences*, 8(2), 1. https://doi.org/10.22146/jfps.658

Jesudoss, V. A. S., Santiago, S. V. A., Venkatachalam, K., & Subramanian, P. 2017. *Zingerone* (ginger extract): antioxidant potential for efficacy in gastrointestinal and liver disease. In *Gastrointestinal tissue* (pp. 289-297). Academic Press. https://doi.org/10.1016/B978-0-12-805377-5.00021-7.

Jie EY, Ahn MS, Lee J, Cheon YI, Kim CY, Kim SW. 2019. Establishment of a high-frequency plant regeneration system from rhizome-derived embryogenic cell-suspension cultures of *Curcuma longa* L. *Plant Biotechnology Reports*, 13:123-129. https://doi.org/10.1007/s11816-019-00519-2.

Johkan, M., Shoji, K., Goto, F., Hashida, S. N., dan Yoshihara, T. 2010. Blue light-emitting diode light irradiation of seedlings improves seedling quality and growth after transplanting in red leaf lettuce. *HortScience*, *45*(12), 1809-1814.

Jung, W. S., Chung, I. M., Hwang, M. H., Kim, S. H., Yu, C. Y., & Ghimire, B. K. 2021. Application of light-emitting diodes for improving the nutritional quality and bioactive compound levels of some crops and medicinal plants. *Molecules*, *26*(5), 1477. https://doi.org/10.3390/molecules26051477.

Jyotirmayee, B. & Mahalik, G. 2022. A review on selected pharmacological activities of *Curcuma longa* L. *International Journal of Food Properties*, 25: 1377-1398. https://doi.org/10.1080/10942912.2022.2082464.

Kapoor, S., Raghuvanshi, R., Bhardwaj, P., Sood, H., Saxena, S., and Chaurasia, O. P. 2018. Influence of light quality on growth, secondary metabolites production and antioxidant activity in callus culture of *Rhodiola imbricata* Edgew. *Journal of Photochememistry and Photobiology B: Biology,* 183: 258–265. https://doi.org/10.1016/j.jphotobiol.2018.04.018.

Kara, A. N., Kotov, A. A., dan Bukhov, N. G. 1997. Specific distribution of gibberellins, cytokinins, indole-3-acetic acid, and abscisic acid in radish plants closely correlates with photomorphogenetic responses to blue or red light. *Journal of plant physiology*, 151: 51-59. https://doi.org/10.1016/S0176-1617(97)80035-1.

Karno, K., Putra, F. P., dan Limantara, J. C. 2022. Efek cahaya LED merah dan biru pada pertumbuhan, hasil dan kandungan klorofil tanaman pakcoy (Brassica chinensis L.) dalam Growbox. *Agromix*, *13*(2), 168-174.

Karunakaran, T., Ngew, K. Z., Zailan, A. A. D., Mian Jong, V. Y., & Abu Bakar, M. H. 2022. The chemical and pharmacological properties of mitragynine and its diastereomers: an insight review. *Frontiers in Pharmacology*, *13*, 805986. https://doi.org/10.3389/fphar.2022.805986.

Khurshid, R., Ullah, M. A., Tungmunnithum, D., Drouet, S., Shah, M., Zaeem, A., ... dan Abbasi, B. H. 2020. Lights triggered differential accumulation of antioxidant and antidiabetic secondary metabolites in callus culture of *Eclipta alba* L. *Plos one*, 15: e0233963. https://doi.org/10.1371/journal.pone.0233963.

Kozai, T., Fujiwara, K., and Runkle, E. S. 2016. *LED Lighting for Urban Agriculture.* Singapore: Springer.

Kubica, P., Szopa, A., Prokopiuk, B., Komsta, L., Pawlowska, B., and Ekiert, H. 2020. The influence of light quality on the production of bioactive metabolites - verbascoside, isoverbascoside and phenolic acids and the content of photosynthetic pigments in biomass of *Verbena officinalis* L. cultured *in vitro*. *Jurnal Photochemistry and Photobiology B:Biology,* 203:111768. https://doi.org/10.1016/j.jphotobiol.2019.111768.

Kuo, T. C. Y., Chen, C. H., Chen, S. H., Lu, I. H., Chu, M. J., Huang, L. C., … dan Chen, L. F. O. 2015. The effect of red light and far-red light conditions on secondary metabolism in Agarwood. *BMC Plant Biology.* 15:139. https://doi.org/10.1186/s12870-015-0537-y.

Kusano, M., Tabuchi, M., Fukushima, A., Funayama, K., Diaz, C., Kobayashi, M., ... & Saito, K. 2011. Metabolomics data reveal a crucial role of cytosolic glutamine synthetase 1; 1 in coordinating metabolic balance in rice. *The Plant Journal*, *66*(3), 456-466. https://doi.org/10.1111/j.1365-313X.2011.04506.x.

Kwon, A.R., Cui, H.Y., Lee, H., Shin, H., Kang, K.S., Park, S.Y., 2015. Light quality affects shoot regeneration, cell division, and wood formation in elite clones of *Populus euramericana*. Acta Physiol. Plantarum 37 (3), 1–9. https://doi.org/10.1007/ s11738-015-1812-0

Laby, R. J., Kincaid, M. S., Kim, D., dan Gibson, S. I. 2000. The Arabidopsis Sugar-Insensitive Mutants Sis4 and Sis5 are Defective In Abscisic Acid Synthesis and Response. *The Plant Journal*, 23: 587-596. https://doi.org/10.1046/j.1365-313x.2000.00833.x.

Lazzarin, M., Meisenburg, M., Meijer, D., Van Ieperen, W., Marcelis, L. F. M., Kappers, I. F., ... dan Dicke, M. 2021. LEDs make it resilient: effects on plant growth and defense. *Trends in Plant Science*, 26: 496-508. https://doi.org/10.1016/j.tplants.2020.11.013.

Lengkong, E. F., dan Pinaria, A. G. 2023. Growth of potato seeds (*Solanum tuberesum* l.) on ms media substituted with coconut water. *Jurnal Agroekoteknologi Terapan*, 4: 361-369. https://doi.org/10.35791/jat.v4i2.50675.

Li, C. X., Xu, Z. G., Dong, R. Q., Chang, S. X., Wang, L. Z., Khalil-Ur-Rehman, M., dan Tao, J. M. 2017. An RNA-seq analysis of grape plantlets grown in vitro reveals different responses to blue, green, red LED light, and white fluorescent light. *Frontiers in plant science*, 8: 78. https://doi.org/10.3389/fpls.2017.00078.

Li, H., Tang, C., Xu, Z., Liu, X., dan Han, X. 2012. Effects of different light sources on the growth of non-heading Chinese cabbage (*Brassica campestris* L.). *Journal of Agricultural Science*, 4: 262.

Li, H., Xu, Z., dan Tang, C. 2010. Effect of light-emitting diodes on growth and morphogenesis of upland cotton (*Gossypium hirsutum* L.) plantlets in vitro. *Plant Cell, Tissue and Organ Culture (PCTOC)*, 103: 155-163. https://doi.org/10.1007/s11240-010-9763-z.

Li, J., Guo, X., Zhang, S., Zhang, Y., Chen, L., Zheng, W., Xue, X., 2022. Effects of light quality on growth, nutritional characteristics, and antioxidant properties of winter wheat seedlings (*Triticum aestivum* L.). *Frontiers in Plant Science,* 13: 978468. https://doi.org/10.3389/fpls.2022.978468.

Li, Q., dan Kubota, C. 2009. Effects of supplemental light quality on growth and phytochemicals of baby leaf lettuce. *Environmental and experimental botany*, 67: 59-64. https://doi.org/10.1016/j.envexpbot.2009.06.011.

Lichtenthaler, H. K., & Wellburn, A. R. 1983. Determinations of total carotenoids and chlorophylls *a* and *b* of leaf extracts in different solvents. *Biochememical Society Transactions.* 11: 591–592. https://doi.org/10.1042/bst0110591.

Lin, K. H., Huang, M. Y., Huang, W. D., Hsu, M. H., Yang, Z. W., dan Yang, C. M. 2013. The effects of red, blue, and white light-emitting diodes on the growth, development, and edible quality of hydroponically grown lettuce. *The Scientific World Journal*, 2013, Article ID 382368. https://doi.org/10.1155/2013/382368

Lin, Y., Li, J., Li, B., He, T., Chun, Z., 2011. Effects of light quality on growth and development of protocorm-like bodies of *Dendrobium officinale in vitro*. Plant Cell Tissue Organ Cult. 105: 329–335. https://doi.org/10.1007/s11240-010-9871-9.

Liu, J. F., Wang, M.Y., Tang, Y.J., Fan, Y.P., Zhong, S.C. dan Chen, Q. 2014. Effects of light qualities on physiological characteristics and accumulation of secondary metabolites in rhizomes of *Curcuma longa* L. *Chinese Journal of Plant Physiology*, 50: 1871-1879.

Liu, X.Y., Guo, S.R., Xu, Z.G., Jiao, X.L., Takafumi, T., 2011. Regulation of chloroplast ultrastructure, cross-section anatomy of leaves and morphology of stomata of cherry tomato by different light irradiations of LEDs. Hortscience 46, 217–221. https://doi.org/10.21273/HORTSCI.46.2.217.

Liu, Y., Dan, Y., Yang, J., He, X., Liu, J., Yi, Y., ... & Ai, Y. 2025. Clinical Efficacy of a Salicylic Acid–Containing Gel on Acne Management and Skin Barrier Function: A 21-Day Prospective Study. *Journal of Cosmetic Dermatology*, *24*(7), e70353. doi: 10.1111/jocd.70353.

Lobiuc, A., Vasilache, V., Pintilie, O., Stoleru, T., Burducea, M., Oroian, M., dan Zamfirache, M. M. 2017. Blue and red LED illumination improves growth and bioactive compounds contents in acyanic and cyanic *Ocimum basilicum* L. microgreens. *Molecules*, 22: 2111. https://doi.org/10.3390/molecules22122111.

Manivannan, A., Soundararajan, P., Park, Y.G., Wei, H., Kim, S.H., dan Jeong, B.R. 2017. Blue and red light-emitting diodes improve the growth and physiology of in vitro-grown carnations 'Green Beauty' and 'Purple Beauty.' *Horticult. Environ. Biotechnol.,* 58, 12?20. https://doi.org/10.1007/s13580-017-0051-2

Marchant, M.J., Molina, P., Montecinos, M., Guzman, L., Balada, C. dan Castro, M. 2022. Effects of LED Light Spectra on the Development, Phytochemical Profile, and Antioxidant Activity of *Curcuma longa* from Easter Island. *Plants*, 11: 2701. https://doi.org/10.3390/plants11202701.

Muthusamy, M., Kim, J.A., Jeong, M.J., Lee, S.I., 2020. Blue and red light upregulate α-expansin 1 (EXPA1) in transgenic Brassica rapa and its overexpression promotes leaf and root growth in Arabidopsis. Plant Growth Regul. 1–13. https://doi.org/10.1007/s10725-020-00588-2.

Nawawi, Jihan, A. 2021. *Efek pemberian Ekstrak Etanol Rimpang Kunyit Liar Endemik Sumatera (Curcuma Sumatrana, Zingiberaceae) Terhadap Tingkat Kecerdasan, Struktur Histologi Otak dan Konsentrasi Malondialdehid Mencit yang Diinduksi Monosodium Glutamat*. Disertasi doktoral, Universitas Andalas.

Nayak, S. 2000. In vitro multiplication and microrhizome induction in *Curcuma aromatica* Salisb. *Plant Growth Regulation*, 32: 41-47. https://doi.org/10.1023/A:1006307316393.

Nhut, D. T., Takamura, T., Watanabe, H., Okamoto, K., dan Tanaka, M. 2003. Responses of in vitro cultured *Chrysanthemum* to light quality and irradiance level using light emitting diodes. *Plant Cell, Tissue and Organ Culture*, 75(2), 241–250. https://doi.org/10.1023/A:1025831118609

Nurainas & Ardiyani, M. 2019. *Curcuma sumatrana*. The IUCN Red List of Threatened Species 2019: e.T117310829A124281750. http://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T117310829A124281750.en.

Pandey, A. dan Agrawal, S.B. 2020. Ultraviolet-B radiation: a potent regulator of flavonoids biosynthesis, accumulation and functions in plants. *Current Science*, 119: 176-185.

Pangestika, R. P., Sutarno, S., dan Karno, K. 2022. PENGARUH WARNA CAHAYA LED DAN LAMA PENYINARAN TERHADAP PERTUMBUHAN DAN KANDUNGAN ANTOSIANIN MICROGREENS KUBIS MERAH (BRASSICA OLERACEA VR. CAPITATA F. RUBRA). *Jurnal AGROHITA: Jurnal Agroteknologi Fakultas Pertanian Universitas Muhammadiyah Tapanuli Selatan*, *7*(4), 701-711.

Parma, F.F. 2024. Kombinasi Intensitas Cahaya dan Konsentrasi Sukrosa dalam Peningkatan Pertumbuhan Tunas *Curcuma sumatrana* Miq. secara *In Vitro*. *Skripsi*. Padang: Universitas Andalas.

Pinheiro, M. V. M., Schmidt, A. P. C., Araújo, G. M., Holz, E., Otoni, W. C., dan Schmidt, D. 2019. Impact of MS concentration and light qualities on alpine red ginger elongation and rooting in vitro. *Plant Cell Culture dan Micropropagation-ISSN 1808-9909*, 15: 40-48.

Pramita, I. P., Gunawan, I. W. P., dan Sastrawan, I. K. 2022. Pengaruh kombinasi LED merah dan biru terhadap pertumbuhan planlet *Kaempferia galanga* secara in vitro. *Jurnal Biologi Tropis*, 22(1), 73–80. https://doi.org/10.29303/jbt.v22i1.3577

Pranadata, F. W. S., & Widoretno, W. 2024. *Pengaruh cahaya LED merah dan biru terhadap pemanjangan tunas dan regenerasi plantlet in vitro Porang*. Tesis Sarjana, Universitas Brawijaya.

Rahayu, R.S. 2024a. Mengenal Koenih Rimbo Setelah 150 Tahun. *Trubus*, 19 Januari, 2024. Website: https://trubus.id/mengenal-koenih-rimbo-setelah-150-tahun/.

Rahayu, R.S. 2024b. Koenih Rimbo Bersatus Konservasi Rentan : BRIN dan Universitas Andalas Lakukan Langkah Penyelamatan. *Trubus*, 16 April, 2024. Website: https://trubus.id/koenih-rimbo-bersatus-konservasi-rentan-brin-dan-universitas-andalas-lakukan-langkah-penyelamatan/

Rahayu, R.S. 2024c. Potensi Koenih Rimbo : Penurun Panas Hingga Antikanker. *Trubus*, 30 Januari, 2024. Website: https://trubus.id/potensi-koenih-rimbo-penurun-panas-hingga-antikanker/

Rahman, A. T., Jethro, A., Santoso, P., Kharisma, V. D., Murtadlo, A. A. A., Purnamasari, D., ... dan Sari, D. A. P. 2022. In Silico Study of the Potential of Endemic Sumatra Wild Turmeric Rhizomes (*Curcuma Sumatrana*: Zingiberaceae) As Anti-Cancer. *Pharmacognosy Journal,* 14: 806-812. http://dx.doi.org/10.5530/pj.2022.14.171.

Raju CS, Kathiravan K, Aslam A, Shajahan A. 2013. An efficient regeneration system via somatic embryogenesis in mango ginger (*Curcuma amada* Roxb.). *Plant Cell Tissue and Organ Culture (PCTOC),* 112: 387-93. https://doi.org/10.1007/s11240-012-0244-4.

Ramírez-Mosqueda, M. A., Iglesias-Andreu, L. G., dan Bautista-Aguilar, J. R. 2017. The effect of light quality on growth and development of in vitro plantlet of *Stevia rebaudiana* Bertoni. *Sugar Tech*, 19: 331-336. https://doi.org/10.1007/s12355-016-0459-5.

Roziqin, C. 2021. *Pengaruh intensitas cahaya LED merah dan biru terhadap pertumbuhan dan produktivitas tanaman cabai rawit (Capsicum frutescens l.) pada sistem indoor* (Doctoral dissertation, Universitas Islam Negeri Maulana Malik Ibrahim).

Salvi, N. D., George, L., dan Eapen, S. 2002. Micropropagation and field evaluation of micropropagated plants of turmeric. *Plant Cell, Tissue and Organ Culture*, *68*: 143-151. https://doi.org/10.1023/A:1013889119887.

Samkumar, A., *et al.* 2021. Red and blue light treatments of ripening bilberry fruits reveal differences in light quality regulation of metabolic pathways. *Plant, Cell dan Environment*, 44(6), 1813–1831. https://doi.org/10.1111/pce.14018

Sarma, I., Deka, A. C., dan Sarma, T. C. 2021. A protocol for rapid clonal propagation and microrhizome production of *Curcuma caesia* Roxb. (Zingiberaceae): A critically endangerd medicinal plant of North East India. *Indian Journal of Agricultural Research*, 55: 13-22. http://dx.doi.org/10.18805/IJARe.A-5338.

Savchenko, T., Kolla, V. A., Wang, C. Q., Nasafi, Z., Hicks, D. R., Phadungchob, B., ... & Dehesh, K. 2014. Functional convergence of oxylipin and abscisic acid pathways controls stomatal closure in response to drought. *Plant physiology*, *164*(3), 1151-1160. https://doi.org/10.1104/pp.113.234310.

Savvides, A., Fanourakis, D., dan van Ieperen, W. 2012. Co-ordination of hydraulic and stomatal conductances across light qualities in cucumber leaves. *Journal of experimental botany*, *63*(3), 1135-1143. https://doi.org/10.1093/jxb/err348.

Sergeeva, L. I., Macháčková, I., Konstantinova, T. N., Golyanovskaya, S. A., Eder, J., Zaltsman, O. O., ... dan Aksenova, N. P. 1994. Morphogenesis of potato plants in vitro. II. Endogenous levels, distribution, and metabolism of IAA and cytokinins. *Journal of Plant Growth Regulation*, 13: 147-152. https://doi.org/10.1007/BF00196379.

Shahinozzaman, M., Ferdous, M., Faruq, M., Azad, M., dan Amin, M. 2013. Micropropagation of black turmeric (*Curcuma caesia* Roxb.) through in vitro culture of rhizome bud explants. *Journal of Central European Agriculture*. https://doi.org/10.5513/jcea.v14i3.2263.

Silva, T. D., Batista, D. S., Fortini, E. A., de Castro, K. M., Sousa Felipe, S. H., Fernandes, A. M., ... dan Otoni, W. C. 2020. Blue and red light affects morphogenesis and 20-hydroxyecdisone content of in vitro *Pfaffia glomerata* accessions. *J. Photochem. Photobiol. B* 203: 111761. https://doi.org/10.1016/j.jphotobiol.2019.111761.

Singh, P., Singh, A. dan Choudhary, K.K. 2023. Revisiting the role of phenylpropanoids in plant defense against UV-B stress. *Plant Stress*, 7: 100143. https://doi.org/10.1016/j.stress.2023.100143.

Smith, H. 1994. Sensing the light environment: the functions of the phytochrome family. In *Photomorphogenesis in plants* (pp. 377-416). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-011-1884-2_15.

Taulavuori, K., Pyysalo, A., Taulavuori, E., & Julkunen-Tiitto, R. 2018. Responses of phenolic acid and flavonoid synthesis to blue and blue-violet light depends on plant species. *Environmental and Experimental Botany*, *150*, 183-187. https://doi.org/10.1016/j.envexpbot.2018.03.016.

Thoma, F., Somborn-Schulz, A., Schlehuber, D., Keuter, V., dan Deerberg, G. 2020. Effects of light on secondary metabolites in selected leafy greens: A review. *Frontiers in plant science*, 11: 497. https://doi.org/10.3389/fpls.2020.00497.

Tilbrook, K., Arongaus, A. B., Binkert, M., Heijde, M., Yin, R., and Ulm, R. 2013. The UVR8 UV-B photoreceptor: perception, signaling and response. *Arabidopsis Book* 11: e0164. https://doi.org/10.1199/tab.0164.

Wang, J., Lu, W., Tong, Y., dan Yang, Q. 2016. Leaf morphology, photosynthetic performance, chlorophyll fluorescence, stomatal development of lettuce (*Lactuca sativa* L.) exposed to different ratios of red light to blue light. *Frontiers in plant science*, 7: 250. https://doi.org/10.3389/fpls.2016.00250.

Wang, T., Tian, X. R., Wu, X. Y., Luo, Z., Li, G., Peng, X. L., et al. 2018. Effect of light quality on total gypenosides accumulation and related key enzyme gene expression in *Gynostemma pentaphyllum*. *Chinese Herbal Medicines,* 10, 34–39. https://doi.org/10.1016/j.chmed.2017.12.004.

Wang, Y. T., Hu, H. H., Lin, M. L., dan Liao, L. J. 2009. Effects of light spectra on growth and photosynthetic characteristics of *Dendrobium officinale*. *Acta Horticulturae Sinica*, 36(10), 1517–1522.

Widiastuti, A., Sawitri, W.D., Idris, M., Handayani, V.D.S., Winona, B., Silalahi, C.M., ..., Setiyadi, A.H. 2024. Unraveling the Potential UV-B Induced Gene Expression of the Primary and Secondary Metabolisms Against Environmental Stress in Shallot. *Reviews in Agirucltural Science*, 12: 111-127. https://doi.org/10.7831/ras.12.0_111.

Wijayanto, H. D., Syaify, A., & Sudibyo. 2016. PENGGUNAAN SUPLEMEN GLUKOSAMIN-KONDROITIN SULFAT PER-ORAL PADA PASIEN OSTEOARTHRITIS PASCA SCALING DAN ROOT PLANING (Kajian Pada Gingival Index, Bleeding on Probing dan Pocket Depth). *Jurnal Kedokteran Gigi*, *7*(2), 73–79.

Wittstock, U., & Burow, M. 2010. Glucosinolate breakdown in Arabidopsis: mechanism, regulation and biological significance. *The Arabidopsis book/American Society of Plant Biologists*, *8*, e0134. https://doi.org/10.1199/tab.0134.

Wu, K., Zhang, X., Sun, S. dan Wang, X. 2015. Factors Affecting the Accumulation of Curcumin in Microrhizomes of *Curcuma aromatica* Salisb. *BioMed Research International*, 2015: 74079. http://dx.doi.org/10.1155/2015/740794.

Wulandari, G., Mulyani, Y., dan Sulaeman, A. 2021. Peran Kunyit (*Curcuma longa*) sebagai Terapi Hipertensi dan Mekanismenya terhadap Ekspresi Gen. *Majalah Farmasi dan Farmakologi*, 25: 51-58.

Wulansari, D., Qodrie, E. N. P., Dharma, B., Kamal, A. S., Hafid, L., Marlina, L., dan Praptiwi, P. (2020). AKTIVITAS ANTIBAKTERI EKSTRAK KULTUR JAMUR ENDOFIT Fusarium sp. CSP-4 YANG DIISOLASI DARI *Curcuma sumatrana* Miq. *BERITA BIOLOGI*, 19: 71-76. http://dx.doi.org/10.14203/beritabiologi.v19i1.3350.

Xie, D., Tarin, M. W. K., Chen, L., Ren, K., Yang, D., Zhou, C., ... dan Zheng, Y. 2021. Consequences of LED lights on root morphological traits and compounds accumulation in *Sarcandra glabra* seedlings. *International Journal of Molecular Sciences*, 22: 7179. https://doi.org/10.3390/ijms22137179.

Yaoyuan, Z., Lau, N. S., dan Subramaniam, S. 2025. Illuminating the harvest: the regulatory effects of LEDs on pigment accumulation in various food crops. *Physiology and Molecular Biology of Plants*, *31*(5), 693–708. https://doi.org/10.1007/s12298-025-01596-0.

Ying, Q., Kong, Y., Jones-Baumgardt, C., dan Zheng, Y. 2020. Responses of yield and appearance quality of four Brassicaceae microgreens to varied blue light proportion in red and blue light-emitting diodes lighting. *Scientia Horticulturae*, *259*, 108857.

Yu, L. lan, Song, C.mei, Sun, L.jing, Li, L.li, Xu, Z.gang, dan Tang, C.ming. 2020. Effects of light-emitting diodes on tissue culture plantlets and seedlings of rice (*Oryza sativa* L.). *Journal of Integrative Agriculture*, 19: 1743-1754. https://doi.org/10.1016/S2095-3119(19)62793-0.

Zhang, L., Wang, G., Wang, G., & Cao, F. 2021. *Ginkgo biloba* L. responds to red and blue light: via phenylpropanoid and flavonoid biosynthesis pathway. *Forests*, *12*(8), 1079. https://doi.org/10.3390/f12081079.

Zhang, Y., Hu W, Peng X *et al.* 2018. Characterization of anthocyanin and proanthocyanidin biosynthesis in two strawberry genotypes during fruit development in response to different light qualities. J Photochem Photobiol B 186:225–231. https:// doi. org/ 10. 1016/j. jphot obiol. 2018. 07. 024

Zhang, S. C., Ma, J. Q., Zou, H. Y., Zhang, L., Li, S. H., and Wang, Y. P. 2020. The combination of blue and red LED light improves growth and phenolic acid contents in *Salvia miltiorrhiza* Bunge. *Industrial Crops and Products,* 158: 112959. https://doi.org/10.1016/j.indcrop.2020.112959.