

DAFTAR PUSTAKA

- Andrejiova, A., Hegedusova, A., Mezeyova, I. & Konova, E. (2017). Content of Selected Bioactive Substance in Dependence on Lightning in *Microgreens*. *Acta Hortilucturae et Regiotecturae*. **1**:6-10.
- Atiyeh, R.M., Subler, S., Edwards, C.A., Bachman, G., Metzger, J.D., Shuster, W. (2000). Effects of vermicomposts and composts on plant growth in horticultural container media and soil. *Pedo Biologia*. **44**:579-590
- Barrett, D.M., Beaulieu, J.C. & Shewfelt, R. (2010). Color, flavor, texture, and nutritional quality of fresh-cut fruits and vegetables: desirable levels, instrumental and sensory measurement, and the effects of processing. *Crit. Rev. Food Sci. Nutr.* **50**:369–389.
- Brazaityte, A., Sakalauskiene, S., Samuoliene, G., Jankauskiene, J., Viršile, A., Novickovas, A., Sirtautas, R., Miliauskiene, J., Vaštakaitė, V., Dabašinskas, L., Duchovskis, P. (2015). The effects of LED illumination spectra and intensityon carotenoid content in Brassicaceae *microgreens*. *Food Chemistry*. **173**:600–606
- Chandra, D., Kim, J. G. & Kim, Y. P. (2012). Changes in microbial population and quality of *microgreens* treated with different sanitizers and packagingfilms. *Horticulture Environment and Biotechnology*. **53**(1):32-40.
- Cianci, M., Rizkallah, P. J., Olczak, A., Raftery, J., Chayen, N. E., Zagalsky, P. F. & Hellwell, J. R. (2002). The molecular basis of the coloration mechanism in lobster shell: Crustacyanin at 3.2-A resolution. *PNAS*. **99**(15): 9795 –9800.
- Craver, J.K., Gerovac, J.R., Boldt, J.K., Lopez, R.G. (2017). Light Intensity and Quality from Sole-source Light-emitting Diodes Impact Growth, Morphology, and Nutrient Content of *Brassica Microgreens*. *J. AMER.SOC.HORT.SCI.* **142**(1):3–12.
- Di Noia. (2014). Defining Powerhouse Fruits and Vegetables: A Nutrient DensityApproach. *Prev. Chronic Dis.* **11**:1-5.
- Eaton-Rye, J.J., Tripathy, B.C. & Sharkey, T.D. (2011). *Photosynthesis: Plastid Biology, Energy Conversion and Carbon Assimilation, Advances in Photosynthesis and Respiration*. Springer: Berlin pp. 63–94.
- Ebert, A. (2012). Sprouts, *microgreens*, and edible flowers: The potential for high valuespecialty produce in Asia. *Asian Vegetable Research and Development Center*. **24**:216-227.



- Foyer, CH. (2018). Reactive oxygen species, oxidative signaling and the regulation of photosynthesis. *Environmental and Experimental Botany*. **154**: 134-142
- Francis, G.A., Gallone, A., Nychas, G.J., Sofos, J.N., Colelli, G., Amodio, M.L. & Spano, G. (2012). Factors affecting quality and safety of fresh-cut produce. *Crit. Rev. Food Sci. Nutr.* **52**:595–610.
- Frede, K., Schreiner, M., Baldermann, S. (2019). Light quality-induced changes of carotenoid composition in pak choi *Brassica rapa* ssp. *chinensis*. *Journal of Photochemistry & Photobiology*. **193**:18–30
- Glantz, S.A. (2012). *Primer of Biostatistics, 7th edition*. McGraw Hill: New York. pp. 133-145
- Gonzales, L.M.R., Caralde, R.A., Aban, M.L. (2015). Response of Pechay (*Brassica napus* L.) to Different Levels of Compost Fertilizer. *International Journal of Scientific and Research Publications*. **5**(2):98-101
- Ifuku, K., Krieger-Liszakay, A., Noguchi, K., & Suzuki, Y. (2020). Editorial: O₂ and ROS Metabolisms in Photosynthetic Organisms. *Frontiers in Plant Science*. **11**:1-3
- Jeon, J., Lim, C.J., Kim, J.K. & Park, S.A. (2018). Comparative Metabolic Profiling of Green and Pakchoi (*Brassica Rapa* Subsp. *Chinensis*). *Molecules*. **23**(7):1-11.
- Jones, C., Olson-Rutz, K., Dinkins, C.P. (2015). *Nutrient Uptake by Plants*. Montana State University Extension: Montana. pp. 1-8
- Jumar, Khamidah, N., Sumantri, B. (2020). Guano LOF (Liquid Organic Fertilizer) as a Substitute for AB Mix Nutrition on the Growth and Yield Response of Pakcoy Plants in Hydroponic Wick System. *IOSR-JAVS*. **13**(4):50-55
- Kalaji, H.M., Oukarroum, A., Alexandrov, A., Kouzmanova, M., Brešić, M., Zivčak, M., Samborska, I.A., Cetner, M.D., Allakhverdiev, S.I., Goltsev, V. (2014). Identification of nutrient deficiency in maize and tomato plants by in vivo chlorophyll a fluorescence measurements. *Plant Physiology and Biochemistry*. **30**:1-10
- Kane, C.D., Jasoni, R.L., Peffley, E.P., Thompson, L.D., Green, C.J., Pare, P., Tissue, D. (2006). Nutrient Solution and Solution pH Influences on Onion Growth and Mineral Content. *Journal of Plant Nutrition*. **29**:375-390



- Kyriacou, M.C., Roushanel, Y., Di Gioia, F., Kyrtatzis, A., Serio, F., Renna, M., De Pascale, F. & Santamaria, P. (2016). Micro-scale vegetable productionand the rise of *Microgreens*. *Trends in Food Sciences & Technology*. **57**:103-115.
- Lefsrud, M.G., D.A. Kopsell, D.E. Kopsell, Curran-Celentano, J. (2006). Irradiance levels affect growth parameters and carotenoid pigments in kale and spinach grown in a controlled environment. *Physiol. Plant.* **127**:624–631.
- Lichtenthaler, H. K. & Buschmann, C. (2001). Chlorophylls and Carotenoids: Measurement and Characterization by UV-VIS Spectroscopy. *Current Protocols in Food Analytical Chemistry*. **1**(1), F4.3.1–F4.3.8.
- Ma, Z., Li, S., Zhang, M., Jiang, S., Xiao, Y. (2010). Light Intensity Affects Growth, Photosynthetic Capability, and Total Flavonoid Accumulation of *Anoectochilus* Plants. *HortScience*. **45**(6):863-867.
- Manullang, I. F., Hasibuan, S., Rita, M.C.H. (2020). Pengaruh Nutrisi Mix dan Media Tanam Berbeda Terhadap Pertumbuhan dan Produksi Tanaman Selada (*Lactuca sativa*) secara Hidroponik dengan Sistem Wick. *Bernas*. **15**(1):82-90.
- Manzocco, L., Foschia, M., Tomasi, N., Maifreni, M., Dalla Costa, L., Marino, M., Cortella, G. & Cesco, S. (2011). Influence of hydroponic and soil cultivation on quality and shelf life of ready-to-eat lamb's lettuce (*Valerianella locusta* L. Laterr). *J. Sci. Food. Agric.* **91**: 1373-1380.
- Mauseth, J.D. (2019). *Botany : An Introduction to Plant Biology*. Jones & Bartlett Learning: Burlington. p. 273
- Mewis, I., Schreiner, M., Nguyen, C., Krumbein, A., Ulrichs, C., Lohse, M. & Zrenner, R. (2012). UV-B irradiation changes specifically the secondary metabolite profilein broccoli sprouts: induced signaling overlaps with defense response to bioticstressors. *Plant Cell Physiol.* **53**:1546–1560.
- Montgomery DC, 2013, *Design and Analysis of Experiments 8th edition*, John Wiley & Sons: Hoboken, p. 104
- Muneer, S., Kim, E.J., Park, J.S. & Lee, J.H. (2014). Influence of Green, Red andBlue Light Emitting Diodes on Multiprotein Complex Proteins and Photosynthetic Activity under Different Light Intensities in Lettuce Leaves (*Lactuca sativa* L.). *Int. J. Mol. Sci.* **15**:4657-4670.
- Nisar, N., Li, L., Lu, S., Khin, N.C. & Pogson, B.J. (2015). Carotenoid Metabolism in Plants. *Molecular Plant. Plant Metabolism and Synthetic Biology*. **8**(1):68–82.



- Polash, M.A.S., Sakil, M.A. & Hossain, M.A. (2018). Post-harvest biodegradation of bioactive substances and antioxidant activity in microgreens. *J. Bangladesh Agril. Univ.* **16**(2): 250–253.
- Raven, P.H., Evert, R.F., Eichhorn, S.E. (2005). *Biology of Plants* (7th ed.). W.H. Freeman and Company Publishers: New York. pp. 504–508
- Rosnina, Mauliza, S. (2020). Optimization of AB-mix Fertilizer on Varieties of Hydroponic Lettuce (*Lactuca sativa L.*). *Journal of Tropical Horticulture*. **3**(2): 86-91
- Ruiz-Sola, M.A. & Rodriguez-Concepcion, M. (2012). Carotenoid Biosynthesis in Arabidopsis: A Colorful Pathway. *The Arabidopsis Book*. **1**: 1-28.
- Salama, H.M.H., Al-Watban, A.A., Al-Fughom, A.T. (2011). Effect of ultraviolet radiation on chlorophyll, carotenoid, protein and proline contents of some annual desert plants. *Saudi Journal of Biological Sciences*. **18**:79-86
- Sandman G. (2019). Antioxidant Protection from UV- and Light-Stress Related to Carotenoid Structures. *Antioxidants*. **8**(219):1-13
- Samuoliene, G., R. Sirtautas, A. Brazaityte, Duchovkis, P. (2012). LED lighting and seasonality affects antioxidant properties of baby leaf lettuce. *Food Chem.* **134**:1494–1499.
- Samuoliene, G., Brazaityte, A, Jankauskiene, J., Virsile, A., Sirtautas, R., Novickovas, A., Sakalauskiene, S., Sakalauskaite, J., Duchovkis, P. (2013). LED irradiance level affects growth and nutritional quality of Brassica microgreens. *Cent. Eur. J. Biol.* **8**(12):1241-1249
- Sassi, M., Ruberti, I., Vernoux, T., Xu, J. (2013). Shedding light on auxin movement: Light-regulation of polar auxin transport in the photocontrol of plant development. *Plant Signaling & Behavior*, **8**(3):1-5
- Smolikova, G. N., & Medvedev, S. S. (2016). Photosynthesis in the seeds of chloroembryophytes. *Russian Journal of Plant Physiology*. **63**(1):1–12.
- Smith, R.H., Murashige, T. (1986). Primordial Leaf and Phytohormone Effects on Excised Shoot Apical Meristems of *Coleus blumei* benth. *Amer. J. Bot.* **69**(8):1334-1339.
- Taiz, L., Zeiger E. (2002). *Plant Physiolog*, 3rd ed. Sinauer Associates:Sunderland. p. 120
- Treadwell, D., Hochmuth, R., Landrum, L. & Laughlin, W. (2010). HS1164 Microgreens: A new specialty crop. *EDIS*. **3**:1-3.



UNIVERSITAS
GADJAH MADA

Pengaruh Cahaya dan Media Tanam terhadap Kadar Klorofil , Karotenoid, dan Hasil Microgreens

Sawi

Sendok (*Brassica rapa L. var. chinensis*)

MAULANA BILAL D P, Dr. Diah Rachmawati, S.Si., M.Si.

Universitas Gadjah Mada, 2021 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Xiao, X., Lester, G., Luo, Y. & Wang, Q. (2012). Assessment of vitamin and carotenoid concentrations of emerging food products: edible *microgreens*. *Journal of Agricultural and Food Chemistry*. **60**(31):7644-7651.

Xiao, Z., Luo, Y., Lester, G.E., Kou, L.P., Yang, T.B. & Wang, Q. (2013). Postharvest quality and shelf life of radish *microgreens* as impacted by storage temperature, packaging film, and chlorine wash treatment. *Food Science and Technology*. **55**:551-558.

Xu, H.I., Mridha, A.U. (2003). Yield and Quality of Leafy Vegetables Grown with Organic Fertilizations. *Acta Horticulturae*. **627**(627): 1-9

Zhang, T., Folta, K. (2012). Green light signaling and adaptive response. *Plant Signal. Behav.* **7**:1–4

Zheng, W., Wang, P., Zhang, H.X., Zhou, D. (2011). Photosynthetic characteristics of the cotyledon and first true leaf of castor (*Ricinus communis* L.). *ACJS*. **5**(6):702-708