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DAFTAR PUSTAKA

Abbasi, A.R., Sarvestani, R., Mohammadi, B., and Baghery, A. 2014. Drought Stress-Induced Changes at Physiological and Biochemical Levels in Some Common Vetch (*Vicia sativa* L.) Genotypes. *Journal of Agricultural Science and Technology*, 16: 505-516.

Abdallah, M.M., Abd El-Monem, A.A., Hassanein, R.A., and ElBassiouny, H.M.S. 2013. Response of Sunflower Plant to the Application of Certain Vitamins and Arbuscular Mycorrhizal Under Different Water Regimes. *Australian Journal of Basic Applied Science*, 7(2): 915-932.

Abd-Elghany, S.E.A., Moustafa, A.A., Gomaa, N.H., and Hamed, B.A. 2021. Mycorrhizal Impact on *Ocimum basilicum* Grown Under Drought Stress. *Journal of Basic and Applied Sciences,* 10: 1-13.

Abdel-Salam, E., Alatar, A., and El-Sheikh, M.A. 2018. Inoculation with Arbuscular Mycorrhizal Fungi Alleviates Harmful Effects of Drought Stress on Damask Rose. *Saudi Journal of Biological Sciences*, 25: 1772–1780.

Abdillah, L., Septian, M.H., dan Mikael, S. 2021. Potensi Pemanfaatan Mikoriza Arbuskula (AM) pada Lahan Hijauan Pakan. *Journal of Livestock Science and Production,* 5(1): 362-370.

Ackah, E. dan Kotei, R. 2021. Effect of Drought Length on the Performance of Cabbage (*Brassica oleracea* var *capitata*) in the Forest-Savannah Transition Zone, Ghana. *Plant Physiology Reports*, 26(1): 74-83.

Adejumo, S.A., Oniosun, B., Akpoilih, O.A., Adeseko, A., and Arowo, D.O. 2021. Anatomical Changes, Osmolytes Accumulation and Distribution in the Native Plants Growing on Pb-Contaminated Sites. *Environmental Geochemistry and Health*, 43: 1537-1549.

Adelia, P., Nurcahyani, E., dan Tundjung, T. 2020. Analisis Kandungan Klorofil Total dan Karbohidrat Terlarut Planlet Sawi Caisim (*Brassica rapa* L.) Resisten terhadap Cekaman Kekeringan Secara In Vitro dengan Poly Ethylene Glycol (PEG) 6000. *Bioeksperimen*, 20(20): 10-20.

Agustinur., Yusran., dan Haros, W. 2018. Peningkatan Kemampuan Tumbuh Tanaman Jagung (*Zea mays* L.) pada Kondisi Cekaman Kekeringan oleh Jamur Mikoriza Arbuskular. *Biocelebes*, 12(3): 23-29.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Ahanger, M.A., Tomar, N.S., Tittal, M., Argal, S., and Agarwal, R. 2017. Plant Growth Under Water/Salt Stress: ROS Production; Antioxidants and Significance of Added Potassium Under Such Conditions. *Physiology and Molecular Biology of Plants*, 23: 731-744.

Ahmed, I.M., Cao, F., Han, Y., Nadira, U.A., Zhang, G., and Wu, F. 2013. Differential Changes in Grain Ultrastructure, Amylase, Protein and Amino Acid Profiles Between Tibetan Wild and Cultivated Barleys Under Drought and Salinity Alone and Combined Stress. *Food Chemistry*, 141(3): 43-50.

Ai, N.S. dan Banyo, Y. 2011. Konsentrasi Klorofil Daun sebagai Indikator Kekurangan Air pada Tanaman. *Jurnal Ilmiah Sains*, 11(2): 166-173.

Ai, N.S. dan Lenak, A.A. 2014. Penggulungan Daun pada Tanaman Monokotil Saat Kekurangan Air (Leaf Rolling in Monocotyledon Plants Under Water Deficit). *Jurnal Bios Logos*, 4(2): 48-55.

Alam, M.Z., Choudhury, T.R., and Mridha, M.A.U. 2023. Arbuscular Mycorrhizal Fungi Enhance Biomass Growth, Mineral Content, and Antioxidant Activity in Tomato Plants Under Drought Stress. *Journal of Food Quality*, 2023: 1-14.

Alam, M.Z., Hoque, M.A., Ahammed, G.J., and Carpenter-Boggs, L. 2020. Effects of Arbuscular Mycorrhizal Fungi, Biochar, Selenium, Silica Gel, and Sulfur on Arsenic Uptake and Biomass Growth in *Pisum sativum* L. *Emerging Contaminants*, 6: 312-322.

Al-Arjani, A.F., Hashem, A., and Abd-Allah, E.F. 2020. Arbuscular Mycorrhizal Fungi Modulates Dynamics Tolerance Expression to Mitigate Drought Stress in *Ephedra foliata* Boiss. *Saudi Journal of Biological Sciences,* 27(1): 380-394.

Al-Babili, S. and Bouwmeester, H.J. 2015. Strigolactones, A Novel Carotenoid-Derived Plant Hormone. *Annual Review of Plant Biology*, 66: 161-186.

Al-Hmoud, G. dan Al-Momany, A. 2017. Effect of Four Mycorrhizal Products on Squash Plant Growth and its Effect on Physiological Plant Elements. *Advances in Crop Science and Technology*, 5(1): 1-6.

Alifah, S., Nurfida, A., dan Herawan, A. 2019. Pengolahan Sawi Hijau Menjadi Mie Hijau yang Memiliki Nilai Ekonomis Tinggi di Desa Sukamanis Kecamatan Kadudampit Kabupaten Sukabumi. *Journal of Empowerment Community*, 1(2): 52-58.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
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Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Alkobaisy, J.S. 2022. Factors Affecting Mycorrhizal Activity. Arbuscular Mycorrhizal Fungi in Agriculture. IntechOpen.

Alwhibi, M.S., Khalil, M.I., Ibrahim, M.M., El-Gaaly, G.A., and Sultan, A.S. 2017. Potential Antitumor Activity and Apoptosis Induction of *Glossostemon bruguieri* Root Extract against Hepatocellular Carcinoma Cells. *Hindawi*, 2017: 1-15.

Amerian, M.R., Stewart, W.S., and Griffiths, H. 2001. Effect of Two Species of Arbuscular Mycorrhizal Fungi on Growth, Assimilation and Leaf Water Relations in Maize (*Zea mays*). *Aspects of Applied Biology*, 63: 73-76.

Amir, H., Cavaloc, Y., Laurent, A., Pagand, P., Gunkel, P., and Lemestre, M. 2019. Arbuscular Mycorrhizal Fungi and Sewage Sludge Enhance Growth and Adaptation of Metrosideros Laurifolia on Ultramafic Soil in New Caledonia: A Field Experiment. *Science of the Total Environment*, 651: 334-343.

Amiri, R., Nikbakht, A., and Etemadi, N. 2015. Alleviation of Drought Stress on Rose Geranium [*Pelargonium graveolens* (L.) Herit.] in Terms of Antioxidant Activity and Secondary Metabolites by Mycorrhizal Inoculation. *Scientia Horticulturae*, 197: 373-380.

Anderson, R., Keshwani, D., Guru, A., Yamg, H., Irmak, S., and Subbiah, J. 2018. An Integrated Modeling Framework for Crop and Biofuel Systems Using the DSSAT and GREET Models. *Environmental Modelling & Software,* 108: 40-50.

Anosheh, H.P., Moucheshi, A.S., Pakniyat, H., dan Pessarakli, M. 2018. Stomatal Responses to Drought Stress. 1: 24-40.

Apel, K. and Hirt, H. 2004. Reactive Oxygen Species: Metabolism, Oxidative Stress, and Signal Transduction. *Annual Review of Plant Biology*, 55: 373-399.

Arjani, A.B.F., Hashem, A., and Elsayed, F.A.A. 2020. Arbuscular Mycorrhizal Fungi Modulates Dynamics Tolerance Expression to Mitigate Drought Stress in *Ephedra foliata* Boiss. *Saudi Journal of Biological Sciences*, 27(1): 380-394.

Asada, K. 2006. Production and Scavenging of Reactive Oxygen Species in Chloroplasts and Their Functions. *Plant Physiology*, 141: 391-396.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
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Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Asghari, M.T. 2022. Effect of Seed Inoculation With Mycorrhizal Fungi and Leaf Application of Amino Acid on Some Qualitative and Herbaceous Properties of Pot Marigold. *Iranian Journal of Seed Science and Research*, 9(3): 57-71.

Aslanpour, M., Banch, H.D., Tehranifar, A., and Shoor, M. 2019. Effects of Water Stress on Growth Traits of Roots and Shoots of the White Seedless Grape. *International Transaction Journal of Engineering, Management, and Applied Sciences and Technologies*, 10(2): 169-181.

Asrar, A.A., Abdel-Fattah, G.M., and Elhindi, K.M. 2012. Improving Growth, Flower Yield, and Water Relations of Snapdragon (*Antirrhinum majus* L.) Plants Grown Under Well-Watered and Water-Stress Conditions Using Arbuscular Mycorrhizal Fungi. *Photosynthetica*, 50: 305-316.

Augé, R.M. 2001. Water Relations, Drought and Vesicular-Arbuscular Mycorrhizal Symbiosis. *Mycorrhiza*, 11: 3-42.

Augé, R.M., Toler, H.D., and Saxton, A.M. 2014. Arbuscular Mycorrhizal Symbiosis Alters Stomatal Conductance of Host Plants More Under Drought than Under Amply Watered Conditions: A Meta-Analysis. *Mycorrhiza*, 25: 13-24.

Augé, R.M., Toler, H.D., and Saxton, A.M. 2016. Mycorrhizal Stimulation of Leaf Gas Exchange in Relation to Root Colonization, Shoot Size, Leaf Phosphorus and Nitrogen: A Quantitative Analysis of the Literature Using Meta-Regression. *Frontiers in Plant Science*, 7: 1084.

Ayub M, Ashraf MY, Kausar A. 2021. Growth and Physio-Biochemical Responses of Maize (*Zea mays* L.) to Drought and Heat Stresses. *Plant Biosystems*, 155(3): 535-542.

Azcon-Aguilar, C. and Barea, J.M. 2015. Nutrient Cycling in the Mycorrhizosphere. *Journal of Soil Science and Plant Nutrition*, 15: 372-396.

Badan Pusat Statistik dan Direktorat Jenderal Hortikultura. 2020. Produksi dan Impor Sayuran di Indonesia.

Baier, M., Kandlbinder, A., Golldack, D., and Dietz, K. 2005. Oxidative Stress and Ozone: Perception, Signaling and Response. *Plant, Cell & Environment*. 28: 1012-1020.

Bailey-Serres, J. and Voesenek, L.A.C.J. 2008. Flooding Stress: Acclimations and Genetic Diversity. *Annual Review of Plant Biology*, 59: 313-339.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Bakr, J., Pék, Z., Helyes, L., and Posta, K. 2018. Mycorrhizal Inoculation Alleviates Water Deficit Impact on Field-Grown Processing Tomato. *Polish Journal of Environmental Studies*, 27:1949-1958.

Balestrini, R., Brunetti, C., Chitarra, W., and Nerva, L. 2020. Photosynthetic Traits and Nitrogen Uptake in Crops: Which is the Role of Arbuscular Mycorrhizal Fungi?. *Plants*, 9(9): 1105.

Balliu, A., Sallaku, G., and Rewald, B. 2015. AMF Inoculation Enhances Growth and Improves the Nutrient Uptake Rates of Transplanted, Salt-Stressed Tomato Seedlings. *Sustainability*, 7: 15967-15981.

Bao, X., Wang, Y., Li, S., and Olsson, P.A. 2019. Arbuscular Mycorrhizal Under Water Carbon-Phosphorus Exchange Between Rice and Arbuscular Mycorrhizal Fungi Under Different Flooding Regimes. *Soil Biology and Biochemistry*, 129: 169-177.

Bashir, S.S., Hussain, A., Hussain, S.J., Wani, O.A., Nabi, S.Z., Dar, N.A., Baloch, F.S., and Mansoor, S. 2021. Plant Drought Stress Tolerance: Understanding Its Physiological, Biochemical and Molecular Mechanisms. *Biotechnology and Biotechnological Equipment*, 35(1): 1912-1925.

Basri, A.H.H. 2018. Kajian Peranan Mikoriza dalam Bidang Pertanian. *Agrica Ekstensia*, 12(2): 74-78.

Basu, S., Ramegowda, V., Kumar, A., and Pereira, A. 2016. Plant Adaptation to Drought Stress [Version 1; Referees: 3 Approved. *Cross Mark*, 1-10.

Bates, L.S., Waldren, R.P., and Teare, I.D. 1973. Rapid Determination of Free Proline for Water Stress Studies. *Plant and Soil*, 39: 205-207.

Becskei, A. and Rahaman, S. 2022. The Life and Death of RNA Across Temperatures. *Computational and Structural Biotechnology Journal*, 20: 4325-4336.

Begum, N., Qin, C., Ahanger, M.A., Raza, S., Khan, M.I., Ashraf, M., Ahmed, N., and Zhang, L. 2019. Role of Arbuscular Mycorrhizal Fungi in Plant Growth Regulation: Implications in Abiotic Stress Tolerance. *Frontiers in Plant Science*, 10: 1-15.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Behrooz, A., Vahdati, K., Rejali, F., Lotf, M., Sarikhani, S., and Leslie, C. 2019. Arbuscular Mycorrhizal and Plant Growth-Promoting Bacteria Alleviate Drought Stress in Walnut. *HortScience*, 54(6): 1087-1092.

Beltrano, J. and Ronco, M.G. 2008. Improved Tolerance of Wheat Plants (*Triticum aestivum* L.) to Drought Stress and Rewatering by the Arbuscular Mycorrhizal Fungus Glomus Claroideum: Effect on Growth and Cell Membrane Stability. *Brazilian Journal of Plant Physiology*, 20(1): 29-37.

Benaffari, W., Boutasknit, A., Anli, M., Mokhtar, M.A.E., Rahou, Y.A., Laouane, R.B., Ahmed, H.B., Mitsui, T., Baslam, M., and Meddich, A. 2022. The Native Arbuscular Mycorrhizal Fungi and Vermicompost-Based Organic Amendments Enhance Soil Fertility, Growth Performance, and the Drought Stress Tolerance of Quinoa. *Plants*, 11: 1-27.

Bernaola, L., Cange, G., Way, M.O., Gore, J., Hardke, J., and Stout, M. 2018. Natural Colonization of Rice by Arbuscular Mycorrhizal Fungi in Different Production Areas. *Rice Science*, 25: 169-174.

Bhargava, S. and Sawant, K. 2013. Drought Stress Adaptation: Metabolic Adjustment and Regulation of Gene Expression. *Plant Breeding*, 132(1): 21-32.

Bhatla, S.C. and Lal, M.A. 2018. *Plant Physiology, Development, and Metabolic*. Singapore: Springer Nature Singapore Pte Ltd.

Bitterlich, M., Rouphael, Y., Graefe, J., and Franken, P. 2018. Arbuscular Mycorrhizas: A Promising Component of Plant Production Systems Provided Favorable Conditions for Their Growth. *Frontiers in Plant Science*, 9: 13-29.

Blatt, M.R. 2014. Focus on Water. *Plant Physiology*, 164(4): 1553-1555.

Bona, E., Cantamessa, S., and Massa, N. 2016. Arbuscular Mycorrhizal Fungi and Plant Growth-Promoting Pseudomonads Improve Yield, Quality and Nutritional Value of Tomato: A Field Study. *Mycorrhiza*, 27: 1-11.

Bonfante, P. and Genre, A. 2010. Mechanisms Underlying Beneficial Plant–Fungus Interactions in Mycorrhizal Symbiosis. *Nature Communication*, 48(1): 1-11.

Boutasknit, A., Baslam, M., Mokhtar, M.A.E., Laouane, R.B., Mitsui, T., and Meddich, A. 2020. Arbuscular Mycorrhizal Fungi Mediate Drought Tolerance and Recovery in Two Contrasting Carob (*Ceratonia siliqua* L.) Ecotypes by

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Regulating Stomatal, Water Relations, and (In) Organic Adjustments. *Plants*, 9(1): 1-19.

Bowles, T. M., Jackson, L.E., and Cavagnaro, T.R. 2018. Mycorrhizal Fungi Enhance Plant Nutrient Acquisition and Modulate Nitrogen Loss with Variable Water Regimes. *Global Change Biology,* 24: 171-182.

Brady, N.C. 2002. *The Nature and Properties of Soils*. New Delhi: Prentice Hall of India.

Brewer, C.A. 1992. Responses by Stomata on Leaves to Microenvironmental Conditions. In C. A. Goldman (Ed.), Tested Studies for Laboratory Teaching. Proceedings of the 13th Workshop/Conference of the Association for Biology Laboratory Education (ABLE).

Bucher, M. 2007. Functional Biology Of Plant Phosphate Uptake At Root And Mycorrhizal Interfaces. *New Phytologist*, 173:11-26.

Burritt, D.J. 2012. Proline and the Cryopreservation of Plant Tissues: Functions and Practical Applications. *Current Frontiers in Cryopreservation,* 415-426.

Byregowda, R., Prasad, S.R., Oelmuller, R., Nataraja, K.N., and Kumar, M.K.P. 2022. R Is Endophytic Colonization of Host Plants a Method of Alleviating Drought Stress? Conceptualizing the Hidden World of Endophytes. *International Journal of Molecular Sciences*, 23(16): 1-31.

Cahyani, N.K.M., Nurhatika, S., dan Muhibuddin, A. 2014. Eksplorasi Mikoriza Vesikular Arbuskular (MVA) Indigenous pada Tanah Aluvial di Kabupaten Pamekasan Madura. *Jurnal Sains dan Seni Pomits*, 3(1): 22-25.

Cambaba, S. dan Maryani. 2016. Karakter Anatomis Daun Kedelai (*Glycine max* (L.) Merril) 'Grobogan' Hasil Perlakuan Kekeringan dan Mulsa Jerami. *Prosiding Seminar Nasional,* 2(1): 881-896.

Card, S., Johnson, L., Teasdale, S., and Caradus, J. 2016. Deciphering Endophyte Behaviour: The Link Between Endophyte Biology and Efficacious Biological Control Agents. *FEMS Microbiology Ecology*, 92.

Carvalho, M.H. 2008. Drought Stress and Reactive Oxygen Species: Production, Scavenging and Signaling. *Plant Signaling & Behavior*, 3: 156-165.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Chandrasekaran, M., Chanratana, M., Kim, K., Seshadri, S., and Sa, T. 2019. Impact of Arbuscular Mycorrhizal Fungi on Photosynthesis, Water Status, and Gas Exchange of Plants Under Salt Stress–A Meta-Analysis. *Frontiers in Plant Science*, 10: 1-10.

Chandrasekaran, M., Sonia, B., Hu, S., Oh, S. H., and Sa, T. 2014. A Meta-Analysis of Arbuscular Mycorrhizal Effects on Plants Grown Under Salt Stress. *Mycorrhiza*, 24: 611-625.

Chaves, M.M., Costa, J.M., and Saibo, N.J.M. 2011. Recent Advances in Photosynthesis Under Drought and Salinity. *Advances in Botanical Research*, 57: 49-104.

Chen J., Zhang H., Zhang X., and Tang M. 2017. Arbuscular Mycorrhizal Symbiosis Alleviates Salt Stress in Black Locust Through Improved Photosynthesis, Water Status, and K+/Na+ Homeostasis. *Frontiers in Plant Science*, 8: 17-39.

Chen, M., Arato, M., Borghi, L., Nouri, E., and Didier, R. 2018. Beneficial Services of Arbuscular Mycorrhizal Fungi - From Ecology to Application. *Frontiers in Plant Science*, 9: 1270.

Chen, W., Meng, P., Feng, H., and Wang, C. 2020. Effects of Arbuscular Mycorrhizal Fungi on Growth and Physiological Performance of *Catalpa bungei* C.A. Mey. Under Drought Stress. *Forests*, 11: 1117.

Cheng, S., Zou, Y.N., Kuca, K., Hashem, A., Abd-Allah, E.F., and Wu, Q.S. 2021. Elucidating the Mechanism Underlying Enhanced Drought Tolerance in Plants Mediated by Arbuscular Mycorrhizal Fungi. *Frontiers in Microbiology*, 1-16.

Chitarra, W., Pagliarani, C., Maserti, B., Lumini, E., Siciliano, I., Cascone, P., Schubert, A., Gambino, G., Balestrini, R., and Guerrieri, E. 2016. Insights on the Impact of Arbuscular Mycorrhizal Symbiosis on Tomato Tolerance to Water Stress. *Journal of Plant Physiology*, 171: 1009-1023.

Chun, S.C., Paramasivan, M., and Chandrasekaran, M. 2018. Proline Accumulation Influenced by Osmotic Stress in Arbuscular Mycorrhizal Symbiotic Plants. *Frontiers in Microbiology,* 1-3.

Colmer, T.D. and Greenway, H. 2011. Ion Transport in Seminal and Adventitious Roots of Cereals During O_2 Deficiency. *Journal of Experimental Botany,* 62: 39-57.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Cosme, M., Fernandez, I., Van, D.H., Marcel, G.A., and Pieterse, C.M.J. 2018. Non-Mycorrhizal Plants: The Exceptions that Prove the Rule. *Trends in Plant Science*, 23(7): 577-587.

Cozzolino, V., Di Meo, V., and Piccolo, A. 2013. Impact of Arbuscular Mycorrhizal Fungi Applications on Maize Production and Soil Phosphorus Availability. *Journal of Geochemical Exploration*, 129: 40-44.

Damaiyanti, D.R.R., Aini, N., dan Soelistyono, R. 2015. Effects of Arbuscular Mycorrhizal Inoculation on Growth and Yield of Tomato (*Lycopersicum esculentum* Mill.) Under Salinity Stress. *Journal of Degraded and Mining Lands Management,* 3(1): 447-452.

Dar, M.I., Naikoo, M.I., Rehman, F., Naushin, F., and Khan, F.A. 2016. Proline Accumulation in Plants: Roles in Stress Tolerance and Plant Development. In Osmolytes and Plants Acclimation to Changing Environment: Emerging Omics Technologies; Springer: Berlin/Heidelberg, Germany, 155-166.

Dariah, A. dan Heryani, N. 2014. Pemberdayaan Lahan Kering Suboptimal untuk Mendukung Kebijakan Diversifikasi dan Ketahanan Pangan. *Jurnal Sumberdaya Lahan Edisi Khusus*, 1-16.

De Col, V., Fuchs, P., Nietzel, T., Elasser, M., Voon. C.P., Candeo, A., Seeliger, I., Fricker, C.G., Meller, I.M., Bassi, A., Boon, L.L., Marco, Z., Meyer, A.J., and Alex, C., Wagner, S., and Schwarzlender, M. 2017. ATP Sensing in Living Plant Cells Reveals Tissue Gradients and Stress Dynamics of Energy Physiology. *eLife*, 25: 6: 1-29.

De Oliveira, V.C. and Joly, C.A. 2010. Flooding Tolerance of *Calophyllum brasiliense* Camb. (Clusiaceae): Morphological, Physiological and Growth Responses. *Trees*, 24: 185-193.

Dewi, S.M., Yuwariah, Y., Qosim, W.A., dan Ruswandi, D. 2019. Pengaruh Cekaman Kekeringan terhadap Hasil dan Sensitivitas Tiga Genotipe Jawawut. *Jurnal Kultivasi*, 18(3): 933-941.

Dien, D.C., Mochizuki, T., and Yamakawa, T. 2019. Effect of Various Drought Stresses and Subsequent Recovery on Proline, Total Soluble Sugar and Starch Metabolisms in Rice (*Oryza sativa* L.) Varieties. *Plant Production Science*, 22(4): 530-545.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Ding, C., Du, S., Ma, Y., Li, X., Zhang, T., and Wang, X. 2019. Changes in the pH of Paddy Soils After Flooding and Drainage: Modeling And Validation. *Geoderma,* 337: 511-513.

Dogra, S., Chand, G., and Sinha, B.K. 2018. Physiological and Biochemical Traits as Tools to Screen Sensitive and Resistant Genotypes of *Brassica juncea* Exposed to Drought Stress. *Journal of Pharmacognosy and Phytochemistry*, 7(5): 877-884.

Dong, H., Mengnan, M., Maoxue, Z., Guangquan, J., Chao, L., and Fengwang, M. 2020. Arbuscular Mycorrhizal Fungi Enhanced Drought Resistance in Apple by Regulating Genes in the MAPK Pathway. *Plant Physiology and Biochemistry*, 149: 245-255.

Dong, J., Jiang, Y., Lyu, M., Cao, C., Li, X., Xiong, X., Lin, W., Yang, Z., Chen, G., Yang, Y., and Xie, J. 2023. Drought Changes the Trade-Off Strategy of Root and Arbuscular Mycorrhizal Fungi Growth in a Subtropical Chinese Fir Plantation. *Forests*, 14(1): 1-15.

Edwards, C.E., Ewers, B.E., and Weinig, C. 2016. Genotypic Variation in Biomass Allocation in Response to Field Drought Has a Greater Affect on Yield than Gas Exchange or Phenology. *BMC Plant Biology*, 25: 169-174.

Elemike, E.E., Uzoh, I.M., Onwudiwe, D.C., and Babalola, O.O. 2019. The Role of Nanotechnology in the Fortification of Plant Nutrients and Improvement of Crop Production. *Applied Sciences*, 9: 499.

El-Esawi, M.A. 2018. *Brassica Germplasm-Characterization, Breeding and Utilization.* London: IntechOpen.

El-Nashar, Y.I. 2017. Response of Snapdragon (*Antirrhinum majus* L.) to Blended Water Irrigation and Arbuscular Mycorrhizal Fungi Inoculation: Uptake of Minerals and Leaf Water Relations. *Photosynthetica,* 55(2): 201-209.

Evelin, H., Giri, B., and Kapoor, R. 2012. Contribution of Glomus intraradices Inoculation to Nutrient Acquisition and Mitigation of Ionic Imbalance in Nacl-Stressed Trigonella foenum-graecum. *Mycorrhiza*, 22: 203-217.

Evelin, H., Kapoor, R., and Giri, B. 2009. Arbuscular Mycorrhizal Fungi in Alleviation of Salt Stress: A Review. *Annals of Botany,* 104: 1263-1280.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Farahani, A., Lebaschi, H., Hussein, M., Hussein, S.A., Reza, V.A., and Jahanfar, D. 2008. Effects of Arbuscular Mycorrhizal Fungi, Different Levels of Phosphorus and Drought Stress on Water Use Efficiency, Relative Water Content and Proline Accumulation Rate of Coriander (*Coriandrum sativum* L.). *Journal of Medicinal Plants Research,* 2(6): 125-131.

Farhad, M.S., Babak, A.M., Reza, Z.M., Hassan, R.S.M., and Afshin, T. 2011. Response of Proline, Soluble Sugars, Photosynthetic Pigments and Antioxidant Enzymes in Potato (*Solanum tuberosum* L.) to Different Irrigation Regimes in Greenhouse Condition. *Australian Journal of Crop Science,* 5: 55.

Farooq, M., Hussain, M., Wahid, A., dan Siddique, K.H.M. 2012. Drought Stress in Plants: An Overview. Plant Responses to Drought Stress. Springer-Verlag. Berlin. 1-33.

Farooq, M., Wahid, A., Kobayashi, N., Fujita, D., and Basra, S.M.A. 2009. Plant Drought Stress: Effects, Mechanisms and Management. *Agronomy for Sustainable Development*, 29: 185-212.

Fathi, A. 2022. Role of Nitrogen (N) in Plant Growth, Photosynthesis Pigments, and N Use Efficiency: A Review. *Agrisost,* 28: 1-8.

Febrianna, M., Prijono, S., dan Novalia, K. 2018. Pemanfaatan Pupuk Organik Cair untuk Meningkatkan Serapan Nitrogen serta Pertumbuhan dan Produksi Sawi (*Brassica juncea* L.) pada Tanah Berpasir. *Jurnal Tanah dan Sumberdaya Lahan,* 5(2): 1009-1018.

Ferdiyanto, R.E., Soelaksini, L.D., dan Herlinawati. 2018. Aplikasi Dosis Mikoriza Vesikular Arbuskular (MVA) dan Waktu Aplikasi terhadap Peningkatan Produksi Tanaman Jagung (*Zea mays* L.). *Jurnal Hexagro,* 2(1): 36-42.

Filipovic, A. 2020. *Water Plant and Soil Relation Under Stress Situation*. IntechOpen.

Filippou, P., Bouchagier, P., Skotti, E., and Fotopoulos, V. 2014. Proline and Reactive Oxygen/Nitrogen Species Metabolism is Involved in the Tolerant Response of the Invasive Plant Species *Ailanthus altissima* to Drought and Salinity. *Environmental and Experimental Botany.* 97: 1-10.

Finlay, R.D. 2008. Ecological Aspects of Mycorrhizal Symbiosis: With Special Emphasis on the Functional Diversity of Interactions Involving the Extraradical Mycelium. *Journal of Experimental Botany,* 59: 1115-1126.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Fiorilli, V., Wang, J.Y., Bonfante, P., Lanfranco, L., and Al-Babili, S. 2019. Apocarotenoids: Old and New Mediators of the Arbuscular Mycorrhizal Symbiosis. *Frontiers in Plant Science,* 10: 1186.

Fitri, M.Z. dan Salam, A. 2017. Deteksi Kandungan Air Relatif pada Daun sebagai Acuan Induksi Pembungaan Jeruk Siam Jember. *Jurnal Agritop,* 15(2): 252-265.

Fusconi, A. 2013. Regulation of Root Morphogenesis in Arbuscular Mycorrhizae: What Role Do Fungal Exudates, Phosphate, Sugars and Hormones Play in Lateral Root Formation?. *Annals of Botany*, 113(1): 19-33.

Gardner, F.P., Pearce, R.B., and Mitchell, R.L. 1991. *Physiology of Crop Plants.* Jakarta: UI-Press.

Genre, A., Chabaud, M., Timmers, T., Bonfante, P., and Barker, D.G. 2005. Arbuscular Mycorrhizal Fungi Elicit A Novel Intracellular Apparatus in Medicago Truncatula Root Epidermal Cells Before Infection. *Plant Cell*, 17: 3489-3499.

Geremew, A., Carson, L., Woldesenbet, S., Carpenter, S., Peace, E., and Aruna, W. 2021. Interactive Effects of Organic Fertilizers and Drought Stress on Growth and Nutrient Content of *Brassica juncea* at Vegetative Stage. *Sustainability*, 13: 1-18.

Ghotbi-Ravandi, A.A., Shahbazi, M., Shariati, M., and Mulo, P. 2014. Effects of Mild and Severe Drought Stress on Photosynthetic Efficiency in Tolerant and Susceptible Barley (*Hordeum vulgare* L.) Genotypes. *Journal of Agronomy and Crop Science*, 200(6): 403-415.

Gogoi, P. 2011. Differential Effect of Some Arbuscular Mycorrhizal Fungi on Growth of *Piper longum* L. (Piperaceae). *Indian Journal of Science and Technology*, 4(2): 119-125.

Goltapeh, E.M., Danesh, Y.Z., Prasad, R., and Varma, A. 2008. *Mycorrhizal Fungi: What We Know and What Should We Know*? In: Varma A (Ed). Mycorrhiza: State of the Art, Genetics and Molecular Biology, Eco-Function, Biotechnology, EcoPhysiology, Structure and Systematics. India. Springer.

Guether, M., Neuhäuser, B., Balestrini, R., Dynowski, M., Ludewig, U., and Bonfante, P. 2009. A Mycorrhizal-Specific Ammonium Transporter from

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Lotus *Japonicus acquires* Nitrogen Released by Arbuscular Mycorrhizal Fungi. *Plant Physiology,* 150: 73-83.

Guo, Y.Y., Yu, H.Y., Kong, D.S., Yan, F., and Zhang, Y.J. 2016. Effects of Drought Stress on Growth and Chlorophyll Fluorescence of *Lycium ruthenicum* Murr. Seedlings. *Photosynthetica*, 54: 524-531.

Gururani, M.A., Venkatesh, J., and Tran, L.S.P. 2015. Regulation of Photosynthesis During Abiotic Stress-Induced Photoinhibition. *Molecular Plant*, 8(9): 1304-1320.

Hadianur, S., Syafruddin., dan Kesumawati, E. 2016. Pengaruh Jenis Fungi Mikoriza Arbuskular terhadap Pertumbuhan dan Hasil Tanaman Tomat (*Lycopersicum esculentum Mill*). *Jurnal Agrista,* 20(3): 126-134.

Halid, E. 2017. Uji Efektivitas Pemberian Fungi Mikoriza Arbuskular terhadap Cekaman Kekeringan Bibit Kakao Klon Lokal. *Agrokompleks,* 16(1): 33-37.

Hamida, R. dan Dewi, K. 2015. Efektivitas Mikoriza Vesikular Arbuskular dan 5-*aminolevulinic Acid* terhadap Pertumbuhan Jagung Varietas Lokal Madura pada Cekaman Kekeringan. *Penelitian Pertanian Tanaman Pangan*, 34(1): 61-67.

Han, Y., Lou, X., Zhang, W., Xu, T., and Tang, M. 2022. Arbuscular Mycorrhizal Fungi Enhanced Drought Resistance of *Populus cathayana* by Regulating the 14-3-3 Family Protein Genes. *Microbiology Spectrum*, 10(3): 1-18.

Harrison, M.J., Dewbre, G.R., and Liu, J. 2002. A Phosphate Transporter From Medicago Truncatula Involved in the Acquisition of Phosphate Released by Arbuscular Mycorrhizal Fungi. *Plant Cell*, 14: 2413-2429.

Hartmann, M., Frey, B., Mayer, J., Mader, P., and Widmer, F. 2015. Distinct Soil Microbial Diversity Under Long-Term Organic and Conventional Farming. *ISME Journal*, 9: 1177-1194.

Hasanah, U., Purnomowati., dan Dwiputranto, U. 2017. Pengaruh Inokulasi Mikoriza Vesikula Arbuskula (MVA) Campuran terhadap Kemunculan Penyakit Layu Fusarium pada Tanaman Tomat (*Solanum lycopersicum*). *Scripta Biologica*, 4(1): 31-35.

Hashem, A., Abd-Allah, E.F., Alqarawi, A.A., and Egamberdieva, D. 2016. Bioremediation of Adverse Impact of Cadmium Toxicity on *Cassia italica*

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Mill by Arbuscular Mycorrhizal Fungi. *Saudi Journal of Biological Sciences*, 23: 39-47.

Hastika, D.W. and Daningsih, E. 2021. Stomatal Number and Size of Dicotyledon Plants. *EPiC Series in Biological Sciences*, 1: 54-60.

Hazman, M. and Brown, K.M. 2018. Progressive Drought Alters Architectural and Anatomical Traits of Rice Roots. *Rice*, 11(1): 2-16.

Hazzoumi, Z., Moustakime, Y., Elharchli, E.H., and Joutei, K.A. 2015. Effect of Arbuscular Mycorrhizal Fungi (AMF) and Water Stress on Growth, Phenolic Compounds, Glandular Hairs, and Yield of Essential Oil in Basil (*Ocimum gratissimum* L.). *Chemical and Biological Technologies in Agriculture*, 2: 1-11.

He, Y., Cornelissen, J.H., Wang, P., Dong, M., and Ou, J. 2019. Nitrogen Transfer from One Plant to Another Depends on Plant Biomass Production between Conspecific and Heterospecific Species Via A Common Arbuscular Mycorrhizal Network. Environ. *Environmental Science and Pollution Research*, 26: 8828-8837.

Heidarianpour, M.B., Aliasgharzad, N., and Olsson, P.A. 2020. Positive Effects of Co-Inoculation with *Rhizophagus irregularis* and *Serendipita indica* on Tomato Growth Under Saline Conditions, and Their Individual Colonization Estimated by Signature Lipids. *Mycorrhiza*, 30: 455-466.

Helyes, L., Pék, Z., Daood, H.G., and Posta, K. 2015. Effect of Mycorrhizal on Main Antioxidant Content of Processing Tomato. *Acta Horticulturae*, 1081: 105-110.

Herawati, N., Syarif, Z., Armansyah., dan Azizah, N. 2020. Respon Tanaman Sereh Wangi (*Andropogon nardus* L.) Akibat Pemberian Mikoriza *Glomus* sp.1 dan Tingkat Pemberian Air yang Berbeda. Seminar Nasional Virtual, Payakumbuh: 24 September. Hal. 89-103.

Hidangmayum, P., Dwivedi, P., Kumar., and Upadhyay, S.K. 2022. Seed Priming and Foliar Application of *Chitosan ameliorate* Drought Stress Responses in Mungbean Genotypes Through Modulation of Morpho-Physiological Attributes and Increased Antioxidative Defense Mechanism. *Journal of Plant Growth Regulation*, 1-18.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Hien La, V., Bok, R.L., Islam, M.T., Mamun, M.A., Sanghyun, P., Dongwon, B., and Taehwan, K. 2020. Characterization of Glutamate-Mediated Hormonal Regulatory Pathway of the Drought Responses in Relation to Proline Metabolism in *Brassica napus* L. *Plants*, 9(4): 1-18.

Hijri, M. 2016. Analysis of a Large Data Set of Mycorrhizal Inoculation Field Trials on Potato Shows Highly Significant Increases in Yield. *Mycorrhiza*, 26: 209-214.

Hill, J.O., Simpson, R., and Ryan, M. 2010. Root Hair Morphology and Mycorrhizal Colonisation of Pasture Species in Response to Phosphorus and Nitrogen Nutrition. *Crop and Pasture Science*, 61(2).

Hopkins, W.G. and Huner, N.P.A. 2009. *Introduction to Plant Physiology*. Canada: John Wiley & Sons, Inc.

Horvath, K.Z., Andryei, B., Helyes, L., PEK, Z., Nemenyi, A., and Nemeskeri, E. 2020. Effect of Mycorrhizal Inoculations on Physiological Traits and Bioactive Compounds of Tomato Under Water Scarcity in Field Conditions. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, 48(3): 1233-1247.

Hossain, M.A., Kumar, V., Burritt, D.J., Fujita, M., and Mäkelä, P. 2019. Osmoprotectant-Mediated Abiotic Stress Tolerance in Plants. In Proline Metabolism and Its Functions in Development and Stress Tolerance; Springer Nature: Cham, Switzerland, 41-72.

Huang, D., Ma, M., Wang, Q., Zhang, M., Jing, G., Li, C., and Ma, F. 2020. Arbuscular Mycorrhizal Fungi Enhanced Drought Resistance in Apple by Regulating Genes in the MAPK Pathway. *Plant Physiology and Biochemistry*, 149: 245-255.

Husen, A., Iqbal, M., and Aref, I.M. 2014. Growth, Water-Status, and Leaf Characteristics of *Brassica carinata* Under Drought and Rehydration Conditions. *Brazilian Journal of Botany*, 37(2): 1-11.

Husna., Tuheteru, F.D., Wulandari, J., Arif, A., Basrudin., Albasri., and Nurdin, W.R. 2021. Respons Pertumbuhan Semai Kayu Kuku [*Pericopsis mooniana* (Thw.) Thw.] dengan Inokulasi Fungi Mikoriza Arbuskula (FMA) Lokal dan Urea pada Media Tanah Serpentine. Prosiding Seminar Nasional Mikoriza, Kendari: 10 Agustus. Hal. 129-148.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Igiehon, O.N. and Babalola, O.O. 2021. Rhizobium and Mycorrhizal Fungal Species Improved Soybean Yield Under Drought Stress Conditions. *Current Microbiology*, 78: 1615-1627.

Integrated Taxonomy Information System (ITIS). 2000. The PLANTS Database. https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=23059#null. Diakses 20 Juni 2023.

Ipsilantis, I. and Sylvia, D.M. 2007. Abundance of Fungi and Bacteria in A Nutrient-Impacted Florida Wetland. *Applied Soil Ecology*, 35(2): 272-280.

Irwan A.W. dan Wicaksono, F.Y. 2017. Perbandingan Pengukuran Luas Daun Kedelai dengan Metode Gravimetri, Regresi, dan Scanner. *Jurnal Kultivasi*, 16(3): 425-429.

Istarofah dan Salamah, Z. 2017. Pertumbuhan Tanaman Sawi Hijau (*Brassica juncea* L.) dengan Pemberian Kompos Berbahan Dasar Daun Paitan (*Tithonia diversifolia*). *Bio-site*, 3(1): 39-46.

Jaiphong, T., Jun, T., Kenta, W., Mai, N., Hiroo, T., Ryuichi, S., Masami, U., and Yoshinobu, K. 2016. Effects of Duration and Combination of Drought and Flood Conditions on Leaf Photosynthesis, Growth and Sugar Content in Sugarcane. *Plant Production Science*, 19(3): 427-437.

Jakobsen, I., Chen, B., Munkvold, L., Lundsgaard, T., and Zhu, Y.G. 2005. Contrasting Phosphate Acquisition of Mycorrhizal Fungi With that of Root Hairs Using the Root Hairless Barley Mutant. *Plant, Cell and Environment*, 28: 928-938.

Jamilah, M., Purnomowati, dan Dwiputranto, U. 2016. Pertumbuhan Cabai Merah (*Capsicum annuum* L.) pada Tanah Masam yang Diinokulasi Mikoriza Vesikula Arbuskula (MVA) Campuran dan Pupuk Fosfat. *Biosfera*, 33(1): 37-45.

Jannah, H. 2011. Respon Tanaman Kedelai terhadap Asosiasi Fungi Mikoriza Arbuskular di Lahan Kering. *Ganec Swara*, 5(2): 28-31.

Jat, M.I., Bhakar, S.R., Sharma, S.K., dan Kothari, A.K. 2016. *Dryland Technology*. Second Edition. New Delhi: Scientific Publisher.

Jiayin, M., Tingting, C., Jie, L., Weimeng, F., Baohua, F., Guangyan, L.,Hubo, L., Juncai, L., Zhihai, W., Longxing, T., and Guanfu, F. 2022. Functions of

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Nitrogen, Phosphorus and Potassium in Energy Status and Their Influences on Rice Growth and Development. *Rice Science,* 29(2): 166-178.

Juairiah, L. 2014. Studi Karakter Stomata Beberapa Jenis Tanaman Revegetasi di Lahan Pasca Pengembangan Timah di Bangka. *Widyariset*, 17(2): 213-218.

Jumrani, K., Bhatia, V.S., Kataria, S., Alamri, S.A., Siddiqui, M.H., and Rastogi, A. 2022. Inoculation with Arbuscular Mycorrhizal Fungi Alleviates the Adverse Effects of High Temperature in Soybean. *Plants*, 11: 1-12.

Kalina, D.S., Plich, J., Zyta, D.S., Sliwka, J., and Marczewski, W. 2016. The Effect of Drought Stress on the Leaf Relative Water Content and Tuber Yield of a Half-Sib Family of 'Katahdin'-Derived Potato Cultivars. *Breeding Science*, 66(2): 328-331.

Kalve, S., Vos, D.D., and Beemster, G.T.S. 2014. Leaf Development: A Cellular Perspective. *Frontiers in Plant Science,* 5: 362.

Kandowangko, N.Y. 2019. *Solusi Kekeringan Tanaman Jagung.* Gorontalo: Ideas Publishing.

Karmilasanti dan Maharani, R. 2016. Keanekaragaman Jenis Jamur Ektomikoriza pada Ekosistem Hutan Dipterokarpa di KHDTK Labanan, Berau, Kalimantan Timur. *Jurnal Penelitian Ekosistem Dipterokarpa*, 2(2): 57-66.

Kartika, Fadilah, L.N., dan Lakitan, B. 2021. Growth Responses and Yield of Cauliflower (*Brassica oleracea* var. botrytis L.) to the Delayed Transplanting and Drought Stress. *E3S Web of Conferences,* 306: 1-9.

Kaur, S. and Sharma, P. 2015. Physiological Response of Indian Mustard (*Brassica juncea* L.) to Different Moisture Regimes. *The Bioscan*, 10: 1357-1365.

Kheradmand, M.A., Fahraji, S.S., and Fatahi, E. 2014. Effect of Water Stress on Oil Yield and Some Characteristics of *Brassica napus*. *International Research Journal of Applied and Basic Sciences*, 8(9): 1447-1453.

Kholodar, S.A., Allen, C.L., Gulick, A.M., dan Murkin, A.S. 2015. The Role of Phosphate in a Multistep Enzymatic Reaction: Reactions of the Substrate and Intermediate in Pieces. *Journal of the American Chemical Society,* 137(7): 2748-2756.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Khorobrykh, S., Havurinne, V., Mattila, H., and Tyystjarvi, E. 2020. Oxygen and ROS in Photosynthesis. *Plants*, 9(1): 1-63.

Kim, C. and Apel, K. 2013. Singlet Oxygen-Mediated Signaling in Plants: Moving From Flu to Wild Type Reveals an Increasing Complexity. *Photosynthesis Research*, 116: 455-464.

Kim, S.J., Lee, H., and Eom, A.H. 2017. Effects of Arbuscular Mycorrhizal Fungi and Soil Conditions on Crop Plant Growth. *Mycobiology*, 45(1): 20-24.

Kondamudi, R., Swamy, K.N., Rao, Y.V., Kiran, T.V., Suman, K., Rao, D.S., Rao, P.R., Subrahmanyam, D., Sarla, N., and Kumari, B.R. 2016. Gas Exchange, Carbon Balance and Stomatal Traits in Wild and Cultivated Rice (*Oryza sativa* L.) Genotypes. *Acta Physiol. Plant*, 38: 1-9.

Kong, J., Pei, Z., Du, M., Sun, G., and Zhang, X. 2014. Effects of Arbuscular Mycorrhizal Fungi on the Drought Resistance of the Mining Area Repair Plant Sainfoin. *International Journal of Mining Science and Technology*, 24: 485-489.

Kozlowski, T.T. and Pallardy, S.G. 2002. Acclimation and Adaptive Responses of Woody Plants to Environmental Stresses. *The Botanical Review*, 68(2): 270-334.

Kumalawati, Z., Kafrawi., dan Elfasila, I. 2015. Kelimpahan Spora Dua Jenis Cendawan Mikoriza Arbuskula pada Rizosfer Bibit Lada (*Piper nigrum* L.) Setelah Aplikasi Pupuk Majemuk. *Jurnal Agroplantae*, 4(1): 35-40.

Ladaniya, M. 2022. *Citrus Fruit: Biology, Technology, and Evaluation.* London: Academic Press.

Lahlou, O., Ouattar, S., dan Ledent, J.F. 2003. Pengaruh Kekeringan dan Varietas terhadap Parameter Pertumbuhan, Hasil dan Komponen Hasil Kentang. *Agronomi*, 23: 257-268.

Lakitan, B. 2013. *Dasar-Dasar Fisiologi Tumbuhan*. Jakarta: Rajawali Press.

Lamaoui, M., Jemo, M., Datia, R., dan Bekkaoui, F. 2018. Heat and Drought Stresses in Crops and Approaches for Their Mitigation. *Frontiers in Plant Science*, 25: 6: 1-14.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Lambers, H. 2021. Phosphorus Acquisition and Utilization in Plants. *Annual Review of Plant Biology*, 73: 17-42.

Lambers, H., Chapin, F.S., and Pons, T.L. 2008. *Plant Physiological Ecology*. Australia: Springer Science and Business Media.

Lanfranco, L., Fiorilli, V., and Gutjahr, C. 2018. Partner Communication and Role of Nutrients in the Arbuscular Mycorrhizal Symbiosis. *New Phytologist*, 220(4): 1031-1046.

Latif, F., Ullah, F., and Mehmood, S. 2016. Effects of Salicylic Acid on Growth and Accumulation of Phenolics in *Zea Mays* L. Under Drought Stress. *Acta Agriculturae Scandinavica*, 66(4): 325-332.

Latz, M.A., Jensen, B., Collinge, D.B., and Jørgensen, H.J. 2018 Endophytic Fungi as Biocontrol Agents: Elucidating Mechanisms in Disease Suppression. *Plant Ecology & Diversity*, 11: 555-567.

Lauteri, M., Haworth, M., Serraj, R., Monteverdi, M.C., and Centritto, M. 2014. Photosynthetic Diffusional Constraints Affect Yield in Drought Stressed Rice Cultivars During Flowering. *PLOS ONE*, 9(10): 1-12.

Li, J., Meng, B., Chai, H., Yang, X., Song, W., Shuixiu, L., Ao, L., Tao, Z., and Sun, W. 2019. Arbuscular Mycorrhizal Fungi Alleviate Drought Stress in C3 (*Leymus chinensis*) and C4 (*Hemarthria altissima*) Grasses via Altering Antioxidant Enzyme Activities and Photosynthesis. *Frontiers in Plant Science*, 25: 10: 1-12.

Li, M. and Kim, C. 2022. Chloroplast ROS and Stress Signaling. *Plant Communication*, 3(1): 1-15.

Li, Y.W., Tong, C.L., and Sun, M.F. 2022. Effect and Molecular Mechanism of Mycorrhiza on the Growth, Nutrient Absorption, Quality of Fresh Leaves, and Antioxidant System of Tea Seedlings Suffering from Salt Stress. *Agronomy*, 12(9): 2163.

Lichtenthaler, H.K. and Buschmann, C. 2001. Chlorophylls and carotenoids: measurement and characterization by UV-VIS spectroscopy. *Current Protocols in Food Analytical Chemistry*, 1(1): 31-38.

Liu, J.J., Chen, J., Xie, K., Tian, Y., Yan, A., Liu, J., Huang, Y., Wang, S., Zhu, Y., and Chen, A. 2020. A Mycorrhiza-Specific H+-ATPase is Essential for

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Arbuscule Development and Symbiotic Phosphate and Nitrogen Uptake. *Plant, Cell & Environment,* 43: 1069-1083.

Liu, J.J., Wei, Z., and Li, J.H. 2014. Effects of Copper on Leaf Membrane Structure and Root Vigor of Maize Seedling. *Botanical Studies*, 55: 1-6.

Liu, T. and Tang, M. 2014. Effects of Arbuscular Mycorrhizal Fungi on Growth and Anatomical Properties of Stomata and Xylem in Poplars. *Chinese Journal of Plant Ecology*, 38(9): 1001-1007.

Liu, T., Sheng, M., Wang, C.Y., Chen, H., Li, Z., and Tang, M. 2015. Impact of Arbuscular Mycorrhizal Fungi on the Growth, Water Status, and Photosynthesis of Hybrid Poplar Under Drought Stress and Recovery. *Photosynthetica*, 53(2): 250-258.

Liu, Z., Cheng, R., Xiao, W., Guo, Q., and Wang, N. 2014. Effect of Off-Season Flooding on Growth, Photosynthesis, Carbohydrate Partitioning, and Nutrient Uptake in *Distylium chinense*. *PLoS ONE*, 9(9): 1-9.

Lynch, J.P. 2015. Root Phenes that Reduce the Metabolic Costs of Soil Exploration: Opportunities for 21st Century Agriculture. *Plant, Cell and Environment*, 38: 1775-1784.

Madouh, T.A. and Quoreshi, A.M. 2023. The Function of Arbuscular Mycorrhizal Fungi Associated with Drought Stress Resistance in Native Plants of Arid Desert Ecosystems: A Review. *Diversity*, 15: 1-17.

Mahanani, A.U., Tuhuteru, S., Haryanto, T.A.D., dan Rif'an, M. 2020. Karakteristik Stomata Daun Tanaman Padi Gogo (*Oryza sativa* L.) Berdasarkan Ketinggian Tempat Tumbuh di Kabupaten Jayawijaya. *Gontor Agrotech Science Journal*, 6(3): 251-281.

Manurung, Y.C., Hanafiah, A.S., dan Marbun, P. 2015. Pengaruh Berbagai Kadar Air Tanah pada Efektivitas Mikoriza Arbuskular terhadap Pertumbuhan dan Serapan Hara Bibit Karet (*Hevea brasiliensis* Muell. Arg.) di Rumah Kasa. *Jurnal Online Agroekoteknologi*, 3(2): 465-475.

Maoka, T. 2020. Carotenoids as Natural Functional Pigments. *Journal of Natural Medicines*, 74: 1-16.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Marantika, M., Hiariej, A., dan Sahertian, E. 2021. Pengujian Kerapatan dan Distribusi Stomata Daun Spesies Mangrove di Desa Negeri Lama Kota Ambon. *Jurnal Ilmu Alam dan Lingkungan*, 12(1): 1-6.

Marschner, H. 1995. *Mineral Nutrition of Higher Plants.* New York: Academic Press.

Marwani, E., Suryatmana, P., Kerana, I.W., Puspanikan, D.L., Setiawadi, M.R., dan Manurung, R. 2013. Peran Mikoriza Vesikular Arbuskular dalam Penyerapan Nutrien, Pertumbuhan, dan Kadar Minyak Jarak (*Jatropha curcas* L.). *Bionatura*, 15(1): 1-7.

Maryono, E., Syafruddin, D., Supiandi, M.I., Bustami, Y., dan Lisa, Y. 2019. Pertumbuhan Tinggi Tanaman Sawi Hijau Melalui Pemberian Campuran Media Tanam Berbahan Apu-Apu. *Jurnal Biologi dan Pembelajarannya*, 6(1): 7-12.

Mathobo, R., Marais, D., and Steyn, J.M. 2017. The Effect of Drought Stress on Yield, Leaf Gaseous Exchange and Chlorophyll Fluorescence of Dry Beans (*Phaseolus vulgaris* L.). *Agricultural Water Management*, 180: 118-125.

Matondang, A.M., Syafruddin., dan Jumini. 2020. Pengaruh Jenis dan Dosis Pupuk Hayati Mikoriza terhadap Pertumbuhan dan Hasil Tanaman Cabai (*Capsicum annuum* L.) pada Tanah Andisol Lembah Seulawah Aceh Besar. *Jurnal Ilmiah Mahasiswa Pertanian*, 5(2): 101-110.

Maylani, E.D., Yuniati, R., and Wardhana, W. 2020. The Effect of Leaf Surface Character on the Ability of Water Hyacinth, *Eichornia crassipes* (Mart.) Solms. to Transpire Water. IOP Conference Series: Materials Science and Engineering, 902: 1-7.

Mbeong., Y.S.N., Umami, N., Hanim, C., Astuti, A., Muhlisin., Rizky, E., and Rahayu, V. 2022. The Effect of Mycorrhizal Provision and Watering Frequency on the Nutrient and Prussic Acid Content of Sorghum (*Sorghum bicolor* (L.) Moench). *Advances in Biological Sciences Research*, 20: 230-236.

Meddich, A., Jaiti, F., Bourzik, W., El-Asli, A., and Hafidi, M. 2015. Use of Mycorrhizal Fungi as a Strategy for Improving the Drought Tolerance in Date Palm (*Phoenix dactylifera*). *Scientia Horticulturae*, 192: 468-474.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Mibei, E.K., Ambuko, J., Giovannoni, J.J., Onyango, A.N., and Owino, W.O. 2017. Carotenoid Profiling of the Leaves of Selected African Eggplant Accessions Subjected to Drought Stress. *Food Science and Nutrition*, 5(1): 113-122.

Mo, Y., Wang, Y., Yang, R., Zheng, J., Liu, C., and Li, H. 2016. Regulation of Plant Growth, Photosynthesis, Antioxidation and Osmosis by an Arbuscular Mycorrhizal Fungus in Watermelon Seedlings Under Well-Watered and Drought Conditions. *Frontiers in Plant Science,* 7: 644.

Moctava, M.A., Koesriharti., dan Dawam, M. 2013. Respon Tiga Varietas Sawi (*Brassica rapa* L.) terhadap Cekaman Air. *Jurnal Produksi Tanaman*, 1(2): 90-98.

Mollavali, M., Bolandnazar, S., Nazemieh, H., Zare, F., and Aliasgharzad, 2015. The Effect of Mycorrhizal Fungi on Antioxidant Activity of Various Cultivars of Onion (*Allium cepa* L). *International Journal of Biosciences*, 6(1): 66-79.

Moller, C.L., Kjollerr, R., and Sand-Jensen, K. 2013. Organic Enrichment of Sediments Reduces Arbuscular Mycorrhizal Fungi in Oligotrophic Lake Plants. *Freshwater Biology*, 58(4).

Mommer, L., Lenssen, J.P.M, Huber, H., Visser, E.J.W, and De, K.H. 2006. Ecophysiological Determinants of Plant Performance Under Flooding: A Comparative Study of Seven Plant Families. *Journal of Ecology*, 94: 1117-1129.

Moradtalab, N., Roghieh, H., Nasser, A., Tobias, E.H., and Günter, N. 2019. Silicon and the Association With An Arbuscular-Mycorrhizal Fungus (*Rhizophagus clarus*) Mitigate the Adverse Effects of Drought Stress on Strawberry. *Agronomy*, 9: 41.

Morales-Olmedo, M., Ortiz, M., and Sellés, G. 2015. Effects of Transient Soil Waterlogging and its Importance for Rootstock Selection. *Chilean Journal of Agricultural Research*, 75: 45-56.

Moriondo, M., Giannakopoulos, C., and Bindi, M. 2011. Climate Change Impact Assessment: The Role of Climate Extremes in Crop Yield Simulation. *Climatic Change*, 104(3): 679-701.

Mudhita, I.K., Umami, N., Sasmito., Budhi, S.P., Baliarti, E., Noviandi, C.T., Kustono., Budisatria, I.G.S., dan Wattimena, J. 2016. Effect of Bali Cattle

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
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Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Urine on Legume Cover Crop Puero (*Pueraria javanica*) Productivity on an East Borneo Oil Palm Plantation. *Pakistan Journal of Nutrition,* 15: 406-411.

Muis, A., Indradewa, D., dan Widada, J. 2013. Pengaruh Inokulasi Mikoriza Arbuskula terhadap Pertumbuhan dan Hasil Kedelai (*Glycine max* (L.) Merrill) pada Berbagai Interval Penyiraman. *Vegetalika,* 2(2): 7-20.

Munthe, K., Pane, E., dan Panggabean, E.L. 2018. Budidaya Tanaman Sawi (*Brassica juncea* L.) pada Media Tanam yang Berbeda secara Vertikultur. *Jurnal Agrotekma,* 2(2): 138-151.

Musfal. 2010. Potensi Cendawan Mikoriza Arbuskula untuk Meningkatkan Hasil Tanaman Jagung. *Jurnal Penelitian dan Pengembangan Pertanian,* 29(4): 154-158.

Muszyńska, E. and Labudda, M. 2019. Dual Role of Metallic Trace Elements in Stress Biology from Negative to Beneficial Impact on Plants. *International Journal of Molecular Sciences*, 20: 3117.

Nabilla, I.O. dan Nurcahyani, E. 2022. Analisis Kandungan Klorofil pada Famili Orchidaceae terhadap Cekaman Kekeringan. *CASSOWARY,* 5(2): 134-139.

Nafees, M., Ullah, S., and Bumi, T. 2019. Vesicular Arbuscular Mycorrhizal (VAM) Studies in Six Pteridophytes in District Buner. *International Journal of Botany Studies*, 4(5): 98-101.

Nagahashi, G. and Douds, D. 2007. Separated Components of Root Exudate and Cytosol Stimulate Different Morphologically Identifiable Types of Branching Responses by Arbuscular Mycorrhizal Fungi. *Mycological Research*, 111(4): 487-92.

Nakmee, P.S., Techapinyawat, S., and Ngamprasit, S. 2016. Comparative Potentials of Native Arbuscular Mycorrhizal Fungi to Improve Nutrient Uptake and Biomass of *Sorghum bicolor* Linn. *Agriculture and Natural Resources*, 50: 173-178.

Nasaruddin and Ridwan, I. 2018. Photosynthetic Apparatus of Soybean Exposed to Drought Due to Application of Arbuscular Mycorrhizal. *Asian Journal of Plant Sciences*, 17(1): 37-46.

Nasaruddin. 2012. Respon Pertumbuhan Bibit Kakao Terhadap Inokulasi Azotobacter dan Mikoriza. *Jurnal Agrivigor,* 11(2): 300-315.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Nawaz, F., Shehzad, M.A., and Majeed, S. 2020. Role of Mineral Nutrition in Improving Drought and Salinity Tolerance in Field Crops. *Springer*, 129-147.

Nazeri, N.K., Lambers, H., Tibbett, M., and Ryan, M.H. 2014. Moderating Mycorrhizal: Arbuscular Mycorrhizal Modify Rhizosphere Chemistry and Maintain Plant Phosphorus Status Within Narrow Boundaries. *Plant, Cell, and Environment*, 37(4): 911-921.

Nell, M., Wawrosch, C., Steinkellner, S., Vierheilig, H., Kopp, B., and Lössl, A. 2010. Root Colonization by Symbiotic Arbuscular Mycorrhizal Fungi Increases Sesquiterpenic Acid Concentrations in *Valeriana officinalis* L. *Planta Medica*, 76: 393-398.

Nemeskéri, E., Molnár, K., Pék, Z., and Helyes, L. 2018. Effect of Water Supply on the Water Use-Related Physiological Traits and Yield of Snap Beans in Dry Seasons. *Irrigation Science*, 36: 143-158.

Nezhadahmadi, A., Faruq, G., and Rashid, K. 2015. Influence of Drought Stress on Leaf Traits of Different Strawberry (*Fragaria ananassa* L.) Varieties in Natural Environment. *Communication in Soil Science and Plant Analysis*, 46(10): 1249-1262.

Nidia, P. 2018. Respon Pertumbuhan Beberapa Genotipe Padi Sawah Lokal Asal Kecamatan Tambang, Kabupaten Kampar pada Berbagai Tingkat Kadar Lengas Tanah. Skripsi. *Tidak Dipublikasikan*. Universitas Islam Negeri Sultan Syarif Kasim Riau.

Nio, S.A., Pirade, M., dan Ludong, D.P.M. 2019. Leaf Chlorophyll Content in North Sulawesi (Indonesia) Local Rice Cultivars Subjected to Polyethylene Glycol (PEG) 8000-Induced Water Deficit at the Vegetative Phase. *Biodiversitas*, 20: 2462-2467.

Novenda, I.L., dan Nugroho, S.A. 2016. Analisis Kandungan Prolin Tanaman Kangkung (*Ipomoea reptans* Poir), Bayam (*Amaranthus spinosus*), dan Ketimun (*Cucumis sativus* L.). *Pancaran*, 5(4): 223-234.

Nurhalimah, S., Nurhatika, S., dan Anton, M. 2014. Eksplorasi Mikoriza Vesikular Arbuskular (MVA) Indigenous pada Tanah Regosol di Pamekasan, Madura. *Jurnal Sains dan Seni POMITS*, 3(1): 2337-3520.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Nurhandayani, R., Linda, R., dan Khotimah, S. 2013. Inventarisasi Jamur Mikoriza Vesikular Arbuskular dari Rhizosfer Tanah Gambut Tanaman Nanas (*Ananas comosus* L. *Jurnal Protobiont*, 2(3): 146-151.

Nurhayati., Siregar, C., Akbar, A., and Sinaga, D. 2022. Determine the Effects of Drought Stress on the Cacao Seedlings (*Theobroma cacao* L.) with Rice Straw Compost. *Asian Journal of Plant Sciences*, 21(2): 215-220.

Nurjanaty, N., Linda, R., dan Mukarlina. 2019. Pengaruh Cekaman Air dan Pemberian Pupuk Daun terhadap Pertumbuhan Tanaman Sawi (*Brassica juncea* L.). *Jurnal Protobiont,* 8(3): 6-11.

Nursafrina, N. 2021. Respon Fisiologi Sawi Caisim (*Brassica juncea* L.) Akibat Penurunan Ketersediaan Air Tanah. Skripsi. *Tidak Dipublikasikan*. Universitas Sumatera Utara.

Oliveira, T.C., Cabral, J.S.R., Santana, L.R., Tavares, G.G., Santos, L.D.S., Paim, T.P., Muller, C., Silva, F.G., Costa, A.C., Souchie, E.L., and Mendes, G.C. 2022. The Arbuscular Mycorrhizal Fungus *Rhizophagus clarus* Improves Physiological Tolerance to Drought Stress in Soybean Plants. *Scientific Reports*, 12: 1-15.

Oreen, N., Nazarian, G., Gharibkhani, M. 2013. The Responses of Stomatal Parameters and SPAD Value in Asian Tobacco Exposed to Chromium. *Polish Journal of Environmental Studies*, 22(5): 1441-1447.

Orsak, M., Katikova, Z., Hnilicka, F., and Lachman, J. 2023. Effect of Long-Term Drought and Waterlogging Stress on Photosynthetic Pigments in Potato. *Plant, Soil and Environment*, 69(4): 152-160.

Panunggul, V.B. 2021. Pengaruh Pupuk Kandang dan Pupuk Hayati Provibio terhadap Pertumbuhan dan Hasil Tanaman Caisim (*Brassica juncea* L). *Jurnal Agroqua,* 19(2): 375-382.

Parihar, P. and Bora, M. 2018. Effect of Mycorrhiza (*Glomus mosseae*) on Morphological and Biochemical Properties of Ashwagandha (*Withania somnifera*) (L.) Dunal. *Journal of Applied and Natural Science*, 10(4): 1115-1123.

Parwata, I.G.M.A., Indradewa, D., Yudono, P., Kertonegoro, B.D., dan Kusmarwiyah, R. 2014. Respon Pertumbuhan dan Hasil Tanaman Jarak Pagar (*Jatropha curcas* L.) terhadap Cekaman Kekeringan di Lahan Pasir Pantai

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

pada Tahun Pertama Siklus Produksi. *Jurnal Agronomi Indonesia*, 42(1): 59-65.

Paszkowski, U. 2006. A Journey Through Signaling in Arbuscular Mycorrhizal Symbioses. Tansley Review. *New Phytologist*, 172: 35-46.

Pepe, A., Giovannetti, M., and Sbrana, C. 2018. Lifespan and Functionality of Mycorrhizal Fungal Mycelium are Uncoupled from Host Plant Lifespan. *Scientific Reports*, 8: 10235.

Phillips, J.M. and Hayman, D.S. 1970. Improved Procedures for Clearing Roots and Staining Parasitic Vesicular-Arbuscular Mycorrhizal Fungi for Rapid Assessment of Infection. *Transactions of the British Mycological Society*, 55: 158-161.

Pirasteh-Anosheh, H., Saed-Moucheshi, A., Pakniyat, H., and Pessarakli, M. 2016. Stomatal Responses to Drought Stress. 11: 24-40.

Plénet, D., Mollier, A., and Pellerin, S. 2000. Growth Analysis of Maize Field Crops Under Phosphorus Deficiency. II. Radiation-Use Efficiency, Biomass Accumulation and Yield Components. *Plant Soil*, 224: 259-272.

Pons, C. and Muller, C. 2022. Impacts of Drought Stress and Mycorrhizal Inoculation on the Performance of Two Spring Wheat Cultivars. *Plants*, 11: 1-18.

Pozo, M.J., López-Ráez, J.A., Azcón-Aguilar, C., and García-Garrido, J.M. 2015. Phytohormones as Integrators of Environmental Signals in the Regulation of Mycorrhizal Symbioses. *New Phytologist*, 205: 1431-1436.

Prasad, R., Bhola, D., Akdi, K., Cruz, C., Sairam, K.V.S.S., and Tuteja, N. 2017. Introduction to Mycorrhizal: Historical Development. 1-7.

Prayudyaningsih, R. 2014. Pertumbuhan Semai *Alstonia scholaris, Acacia auriculiformis* dan *Muntingia calabura* yang Diinokulasi Fungi Mikoriza Arbuskula pada Media Tanah Bekas Tambang Kapur. *Jurnal Penelitian Kehutanan Wallacea*, 3(1): 13-23.

Prihastanti, E. 2016. Respon Morfofisiologi Tanaman Kakao (*Theobroma cacao* L.) Terhadap Cekaman Kekeringan di Kawasan Agroforestri Sekitar Taman Nasional Lore Lindu Sulawesi Tengah Indonesia. Disertasi. *Tidak Dipublikasikan.* Institut Pertanian Bogor.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Pumplin, N., Mondo, S.J., Topp, S., Starker, C.G., Gantt, J.S., and Harrison, M.J. 2010. Medicago truncatula Vapyrin is a Novel Protein Required for Arbuscular Mycorrhizal Symbiosis. *The Plant Journal*, 61: 482–494.

Purbajanti, E.D., Muzakki, A., and Budiyanto, S. 2021. Application of Cow Manure and Plant Growth Promoting Rhizobacteria on Growth and Production of Mustard (*Brassica juncea* L.). *Journal of Applied Sciences*, 22(3): 122-126.

Putri, T.E., Yuliani., dan Trimulyono, G. 2019. Penggunaan Mikoriza Vesikular Arbuskular (MVA) Genus *Glomus* untuk Meningkatkan Pertumbuhan dan Produksi Kacang Hijau (*Vigna radiata*) pada Cekaman Air. *LenteraBio*, 8(2): 107-112.

Qiuhong, Y., Hua, W., and Hua, L. 2022. Arbuscular Mycorrhizal Fungi Improve Growth, Photosynthetic Activity, and Chlorophyll Fluorescence of *Vitis vinifera* L. cv. Ecolly Under Drought Stress. *Agronomy*, 12(7): 1-14.

Quiroga, G., Erice, G., Aroca, R., Chaumont, F., and Ruiz-Lozano, J.M. 2017. Enhanced Drought Stress Tolerance by the Arbuscular Mycorrhizal Symbiosis in a Drought-Sensitive Maize Cultivar is Related to a Broader and Differential Regulation of Host Plant Aquaporins than in a Drought-Tolerant Cultivar. *Frontiers in Plant Science*, 8: 1056.

Quiroga, G., Erice, G., Aroca, R., Chaumont, F., and Ruiz-Lozano, J.M. 2019. Contribution of the Arbuscular Mycorrhizal Symbiosis to the Regulation of Radial Root Water Transport in Maize Plants Under Water Deficit. *Environmental and Experimental Botany*, 167: 103821.

Rahdari, P. and Hoseini, S.M. 2012. Drought Stress: A Review. *International Journal of Agronomy and Plant Production*, 3: 443-446.

Rambabu, B., Padma, V., Thatikunta, R., and Sunil, N. 2016. Effect of Drought Stress on Chlorophyll Content and Antioxidant Enzymes of Green Gram Genotypes (*Vigna radiata* L.). *Nature Environment and Pollution Technology*, 15(4): 1205-1208.

Ranganayakulu, G., Sudhakar, C., and Reddy, P. 2015. Effect of Water Stress on Proline Metabolism and Leaf Relative Water Content in Two High Yielding Genotypes of Groundnut (*Arachis hypogaea* L.) with Contrasting Drought Tolerance. *Journal of Experimental Biology*, 3: 97-103.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Rapparini, F. and Peñuelas, J. 2014. Mycorrhizal Fungi to Alleviate Drought Stress on Plant Growth. *Jurnal Use of Microbes for the Alleviation of Soil Stresses*, 1: 21-42.

Rasouli-Sadaghiani, M., Hassani, A., Barin, M., Danesh, Y.R., and Sefidkon, F. 2010. Effects of AM Fungi on Growth, Essential Oil Production and Nutrients Uptake in Basil. *Journal of Medicinal Plants Research*, 4(21): 2222-2228.

Ray, A.M. and Inouye, R.S. 2006. Effect of Water-Level Fluctuations on the Arbuscular Mycorrhizal Colonization of *Typha latifolia* L. *Aquatic Botany*, 84: 210-216.

Ren, B.Z., Zhang, J.W., Li, X., Fan, X., Dong, S.T., Liu, P., and Zhao, B. 2014. Effects of Waterlogging on the Yield and Growth of Summer Maize Under Field Conditions. *Canadian Journal of Plant Science*, 94: 23-31.

Rezazadeh, S., Ilkaee, M., Aghayari, F., Paknejad, F., and Rezaee, M. 2021. Growth, Yield, Nutrients Uptake and Anatomical Properties of Direct Seeding and Transplanting Maize (*Zea mays* L.) Plants Under Arbuscular Mycorrhizal Fungi and Water Stress. *Journal of Biological Research*, 94: 11-17.

Rini, D.S., Budiarjo., dan Gunawan, I. 2020. The Mechanism of Plant Response to Drought Stress. *Journal of Ilmu-ilmu Hayati LIPI*, 19(3B): 373-384.

Riyadi, A.D.R. dan Siswanti, D.U. 2022. Effect of Alkaline and Drought Stress on Growth and SOD Content in Basil Plant (*Ocimum americanum*). *Jurnal Biodjati*, 7(1): 119-131.

Rotwell, F.M. 1984. Aggregation of Surface Mine Soil by Interaction Between VAM Fungi and Lignin Degradation Product of Lespedeza. *Journal Plant and Soil*, 80-99.

Ruiz-Lozano, J.M., Aroca, R., Zamarreño, Á.M., Molina, S., Andreo-Jiménez, B., and Porcel, R. 2015. Arbuscular Mycorrhizal Symbiosis Induces Strigolactone Biosynthesis Under Drought and Improves Drought Tolerance in Lettuce and Tomato. *Plant Cell Environment*, 39(2): 441-452.

Rusmana., Ningsih, E.P., dan Hikmah, A.N. 2022. Effect of Drought Stress and Mycorrhizal Dose on Growth and Yield of Maize (*Zea mays* L.). IOP Conference Series: Earth and Environmental Science, 951: 1-8.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Ryan, M.H., Tibbett, M., and Edmonds-Tibbett, T. 2012. Carbon Trading for Phosphorus Gain: The Balance Between Rhizosphere Carboxylates and Arbuscular Mycorrhizal Symbiosis in Plant Phosphorus Acquisition. *Plant, Cell and Environment*, 35: 2170-2180.

Sablowski, R. and Domelas, M.C. 2014. Interplay between Cell Growth and Cell Cycle in Plants. *Journal of Experimental Botany*, 65(10): 2703-14.

Saboor, A., Ali, M.A., Danish, S., Ahmed, N., Fahad, S., Datta, R., Ansari, M.J., Nasif, O., Rahman, M.H., and Glick, B.R. 2021. Effect of Arbuscular Mycorrhizal Fungi on the Physiological Functioning of Maize Under Zinc-Deficient Soils. *Scientific Reports*, 11: 1-11.

Saha, S., Begum, H.H., and Nasrin, S. 2019. Effects of Drought Stress on Growth and Accumulation of Proline in Five Rice Varieties (*Oryza sativa* L.). *Journal of the Asiatic Society of Bangladesh, Science*, 45(2): 241-247.

Saha, S., Begum, H.H., Nasrin, S., and Samad, R. 2020. Effects of Drought Stress on Pigment and Protein Contents and Antioxidant Enzyme Activities in Five Varieties of Rice (*Oryza sativa* L.). *Bangladesh Journal of Biology*, 49(4): 997-1002.

Saidah, L., Nurhati, S., dan Muhibuddin, A. 2018. Peran VAM (Vesicular Arbuscular Mycorrhizal) terhadap Aktivitas Fotosintetik dan Produksi Osmoprotektan pada Tanaman Kedelai (*Glycine max* L.) di Tanah Kering. *Jurnal Sains dan Seni ITS*, 7(2): 2337-3520.

Salisbury, F. and Ross, C.W. 1992. *Fisiologi Tumbuhan Jilid 3*. Bandung: ITB Press.

Sallata, M.K. 2013. Pinus (*Pinus merkusii* Jungh et de Vriese) dan Keberadaannya di Kabupaten Tana Toraja, Sulawesi Selatan. *Buletin Eboni,* 10(2): 85-98.

Salmeron-Santiago, I.A., Martinez-Trujillo, M., Valdez-Alarcón, J.J., Pedraza-Santos, M.E., Santoyo, G., Pozo, M.J., and Chávez-Bárcenas, A.T. 2022. An Updated Review on the Modulation of Carbon Partitioning and Allocation in Arbuscular Mycorrhizal Plants. *Microorganism*, 10(1): 1-20.

Sari, S. dan Zahrosa, D.B. 2020. *Lahan Marginal: Menyimpan Ragam Potensi*. Jember: Polije Press.

Sasidharan, R. and Voesenek, L.A.C.J. 2015. Ethylene-Mediated Acclimations to Flooding Stress. *Plant Physiology*, 169: 3-12.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Sasmita, M.W.S., Nurhatika, S., dan Muhibuddin, A. 2019. Pengaruh Dosis Mikoriza Arbuskular pada Media AMB-P0K terhadap Pertumbuhan Tanaman Tembakau (*Nicotiana tabacum* var. Somporis). *Jurnal Sains dan Seni ITS*, 8(2): 43-48.

Sastrahidayat, I.R. 2011. *Rekayasa Pupuk Hayati Mikoriza dalam Meningkatkan Produksi Pertanian*. Malang: Universitas Brawijaya Press.

Shaneka, S., Lawson, P., Pijut, M., and Michler, C.H. 2014. Comparison of Arabidopsis Stomatal Density Mutants Indicates Variation in Water Stress Responses and Potential Epistatic Effects. *Journal Plant Biology*, 57: 162-173.

Shao, H.B., Chu, L.Y., Jaleel, C.A., and Zhao, C.X. 2008. Water-Deficit Stress-Induced Anatomical Changes in Higher Plants. 331: 215-225.

Sharma, S.B., Sayyed, R.Z., Trivedi, M.H., and Gobi, T. 2013. A Phosphate Solubilizing Microbes: Sustainable Approach for Managing Phosphorus Deficiency in Agricultural Soils. *SpringerPlus*, 2: 587.

Shekari, F., Soltaniband, V., Javanmard, A., and Abbasi, A. 2015. The Impact of Drought Stress at Different Stages of Development on Water Relations, Stomatal Density and Quality Changes of Rapeseed (*Brassica napus* L.). *Iran Agricultural Research*, 34(2): 81-90.

Silitonga, Y.W. dan Nasution, M.N.H. 2020. Efektivitas Cendawan Mikoriza Arbuskula terhadap Pertumbuhan dan Produksi Jagung Putih (*Zea Mays* L.). *Jurnal Ilmu Pertanian*, 23(1):56-57.

Sinay, H. 2015. Pengaruh Perlakuan Cekaman Kekeringan terhadap Pertumbuhan dan Kandungan Prolin pada Fase Vegetatif Beberapa Kultivar Jagung Lokal dari Pulau Kisar Maluku di Rumah Kaca. Seminar Nasional Pendidikan Biologi, Malang: 21 Maret. Hal. 228-237.

Singh, A. and Prasad, S.M. 2014. Effect of Agro-Industrial Waste Amendment on Cd Uptake in *Amaranthus caudatus* Grown Under Contaminated Soil: An Oxidative Biomarker Responses. *Ecotoxicology and Environmental Safety*, 100: 105-113.

Singh, M., Kumar, J., Singh, S., Singh, V.P., and Prasad, S.M. 2015. Roles of Osmoprotectants in Improving Salinity and Drought Tolerance in Plants: A Review. *Reviews in Environmental Science and Bio/Technology*, 14: 407-426.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Sishadi, E. 2019. Estimasi Biomassa Tanaman Edamame (*Glycine max* L.) Menggunakan *Ground-Based Remote Sensing*. Skripsi. *Tidak Dipublikasikan*. Universitas Jember.

Slayter, R.O. and Barrs, H.D. 1965. Modifications to the Relative Turgidity Technique with Notes on its Significance as an Index of the Internal Water Status of Leaves. *Proceedings of the Montpellier Symposium. Eco-physiology.* 25: 331-342.

Smith, S.E. and Read, D. 2008. *Mycorrhizal Symbiosis.* Third Edition. New York: Academic Press. Elsevier.

Sochacki, P., Ward J.R., and Cruzan M.B. 2013. Consequences of Mycorrhizal Colonization for Piriqueta Morphotypes Under Drought Stress. *International Journal of Plant Sciences*, 174: 65-73.

Song, H. 2005. Effects of VAM on Host Plant in the Condition of Drought Stress and Its Mechanisms. *Electronic Journal of Biology*, 1(3): 44-48.

Sowmen, S., Abdullah, P.D.M.H., dan Soepandi, D. 2014. Adaptasi Legum Pohon yang Diinokulasi dengan Fungi Mikoriza Arbuskular (FMA) Saat Cekaman Kekeringan. *Jurnal Peternakan Indonesia*, 16(1): 46-54.

Steffens, B. and Rasmussen, A. 2016. The Physiology of Adventitious Roots. *Jurnal MEDIAGRO*, 120(2): 603-617.

Steinthorsdottir, M., Vajda., and Pole, M. 2019. Significant Transient pCO2 Perturbation at the New Zealand Oligocene-Miocene transition Recorded by Fossil Plant Stomata. *Palaeogeogr Palaeoclimatol Palaeoecol*, 515: 152-161.

Subantoro, R. 2014. Pengaruh Cekaman Kekeringan terhadap Respon Fisiologis Perkecambahan Benih Kacang Tanah (*Arachis hypogaea* L.). *Jurnal MEDIAGRO*, 10(2): 32-44.

Subramanian, K.S., Bharathi, C., and Jegan, A. 2008. Response of Maize to Mycorrhizal Colonization at Varying Levels of Zinc And Phosphorus. *Biology and Fertility of Soils*, 45: 133-144.

Suete, F., Samudin, S., dan Hasanah, U. 2017. Respon Pertumbuhan Padi Gogo (*Oryza sativa*) Kultivar Lokal pada Berbagai Tingkat Kelengasan Tanah. *Agrotekbis*, 5(2): 173-182.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Sugiura, Y., Akiyama, R., Tanaka, S., Yano, K., Kameoka, H., Marui, S., Saito, M., Kawaguchi, M., Akiyama, K., and Saito, K. 2020. Myristate Can Be Used as a Carbon and Energy Source for the Asymbiotic Growth of Arbuscular Mycorrhizal Fungi. *PNAS*, 117(41): 25779-25788.

Sukmasari, M.D. 2018. Pemanfaatan Mikoriza Arbuskular pada Tiga Kultivar Tanaman Kedelai (*Glycine max* L. Merrill) di Lahan Kering Majalengka. *Jurnal Ilmu Pertanian dan Peternakan,* 6(1): 1-7.

Sulistiono, W., Taryono, T., Yudono, P., dan Irham, I. 2017. Early-Arbuscular Mycorrhizal Fungi-Application Improved Physiological Performances of Sugarcane Seedling and Further Growth in the Dry Land. *Journal of Agricultural Science*, 9(4).

Sulistyono, E., Suwarno., Lubis, I., dan Suhendar, D. 2012. Pengaruh Frekuensi Irigasi terhadap Pertumbuhan dan Produksi Lima Galur Padi Sawah. *Agrovigor,* 5(1): 1-8.

Sumadji, A.R. 2020. Kerapatan Stomata dan Kaitannya terhadap Kekeringan pada Tanaman Padi Varietas Ir64. *Widya Warta,* 1: 43-54.

Sun, J., Jia, Q., Li, Y., Zhang, T., Chen, J., Ren, Y., Dong, K., Xu, S., Shi, N-N., and Fu, S. 2022. Effects of Arbuscular Mycorrhizal Fungi and Biochar on Growth, Nutrient Absorption, and Physiological Properties of Maize (*Zea mays* L.). *Journal Fungi*, 8(12): 1275.

Sun, Z., Song, J., Xin, X., Xie, X., and Zhao, B. 2018. Arbuscular Mycorrhizal Fungal Proteins 14-3-3- are Involved in Arbuscule Formation and Responses to Abiotic Stresses During AM Symbiosis. *Frontiers in Microbiology*, 5: 9-19.

Suryani, R., Gafur, S., dan Abdurrahman, T. 2017. Respon Tanaman Bawang Merah terhadap Cendawan Mikoriza Arbuskula (CMA) pada Cekaman Kekeringan di Tanah Gambut. *Jurnal Pedon Tropika,* 3(1): 69-78.

Suryanti, S., Indradewa, D., Sudira, P., dan Widada, J. 2015. Kebutuhan Air, Efisiensi Penggunaan Air, dan Ketahanan Kekeringan Kultivar Kedelai. *Jurnal Agritech,* 35(1): 114-120.

Sutikno. 2018. *Buku Praktikum Mikroteknik Tumbuhan*. Yogyakarta: UGM Press.

Swaef, T.D., Pieters, O., Appeltans, S., Borra-Serrano, I., Coudron, W., Couvreur, V., Garre, S., Lootens, P., Nicolai, B., Pols, L., Cast, C.S., Salagovic, J.,

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Haeverbeke, M.V., Stock, M., and Wyffels, F. 2022. On the Pivotal Role of Water Potential to Model Plant Physiological Processes. *In Silico Plants,* 4(1).

Syamsia., Idhan, A., Noerfitriyani., Nadir, M., Reta, and Kadir, M. 2018. Paddy Chlorophyll Concentrations in Drought Stress Condition and Endophytic Fungi Application. *Earth and Environmental Science,* 156.

Tabrizi, E.F.M. and Babashpour-Asl, M. 2021. Bio-fertilizer Impact on Production Efficiency and Yield of Corn (*Zea mays*) Cultivars Under Water Deficiency. *Agritech,* 41(1): 85-94.

Tahani, N.A. 2016. Pengaruh *Acetyl Salicylic Acid* (ASA) terhadap Pertumbuhan Sawi (*Brassica juncea* L.) pada Kondisi Cekaman Kekeringan. Skripsi. *Tidak Dipublikasikan*. Universitas Islam Negeri Maulana Malik Ibrahim.

Taiz, L. and Zeiger, E. 2002. *Plant Physiology*. Massachusetts: Sinauer Associates Inc. Publisher.

Tambaru, E., Ura, R., dan Tuwo, M. 2018. Karakterisasi Stomata Daun Tanaman Obat *Anredera cordifolia* (Ten.) Steenis dan *Graptophyllum pictum* (L.) Griff. *Jurnal Ilmu Alam dan Lingkungan*, 9(17): 42-47.

Tan, X., Xu, H., Khan, S., Equiza, M.A., Lee S.H., and Vaziriyeganeh, M. 2018. Plant Water Transport and Aquaporins in Oxygen-Deprived Environments. *Journal of Plant Physiology,* 227: 20-30.

Thakur, J. and Shinde, B.P. 2020. Effect of Water Stress and AM Fungi on the Growth Performance of Pea Plant. *International Journal of Applied Biology*, 4(1).

Tian, L., Chang, C., Ma, L., Nasir, F., Zhang, J., Li, W., Tran, L., and Tian, C. 2019. Comparative Study of the Mycorrhizal Root Transcriptomes of Wild and Cultivated Rice in Response to the Pathogen *Magnaporthe oryzae*. *Rice,* 12: 1-19.

Tian, Y. and Deng, F. 2020. Phytochemistry and Biological Activity of Mustard (*Brassica juncea*): A Review. *Cyta- Journal of Food,* 18(1): 704-718.

Tourneux, C., Devaux, A., Camacho, M.R., Mamani, P., dan Ledent, J.F. 2003. Efek Kekurangan Air pada Enam Genotipe Kentang di Dataran Tinggi Bolivia (I): Parameter Morfologi, Pertumbuhan dan Hasil. *Agronomi,* 23: 169-179.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Utari, D. 2021. Respons Pertumbuhan dan Kadar Kapsaisin Tanaman Cabai Merah Keriting (*Capsicum annuum* L.) terhadap Kekeringan dan Pemberian Pupuk Mikoriza Arbuskular. Skripsi. *Tidak Dipublikasikan.* Universitas Gadjah Mada.

Varone, L., Ribas-Carbo, M., Cardona, C., Gallé, A., Medrano, H., Gratani, L., and Flexas, J. 2012 Stomatal and Non-Stomatal Limitations to Photosynthesis in Seedlings and Saplings of Mediterranean Species Pre-Conditioned and Aged in Nurseries: Different Response to Water Stress. *Environmental and Experimental Botany*, 75: 235-247.

Walter, M.H., Floss, D.S., and Strack, D. 2010. Apocarotenoids: Hormones, Mycorrhizal Metabolites and Aroma Volatiles. *Planta*, 232: 1-17.

Wang, J.Y., Haider, I., Jamil, M., Fiorilli, V., Saito, Y., and Mi, J. 2019. The Apocarotenoid Metabolite Zaxinone Regulates Growth and Strigolactone Biosynthesis in Rice. *Nature Communications*, 10: 810.

Wang, S., Ren, Y., Lina, H., Yuying, N., Shuyuan, Z., Xianan, X., Wentao, H., Hui, C., and Ming, T. 2023. Insights on the Impact of Arbuscular Mycorrhizal Symbiosis on *Eucalyptus grandis* Tolerance to Drought Stress. *American Society for Microbiology Journal*, 1-14.

Wang, W., Shi, J., Xie, Q., Jiang, Y., Yu, N., and Wang, E. 2017. Nutrient Exchange and Regulation in Arbuscular Mycorrhizal Symbiosis. *Molecular Plant*, 10: 1147-1158.

Wang, X., Ji, Q., and Xie, J. 2021. Abscisic Acid and Jasmonic Acid are Involved in Drought Priming-Induced Tolerance to Drought in Wheat. *The Crop Journal*, 9: 120-132.

Wang, Y., Li, Y., Bao, X., Björn, L.O., Li, S., and Olsson, P.A. 2016. Response Differences of Arbuscular Mycorrhizal Fungi Communities in the Roots of an Aquatic and a Semiaquatic Species to Various Flooding Regimes. *Plant Soil*, 403: 361-373.

Wang, Y., Qiu, Q., Yang, Z., Hu, Z., Tam, N., and Xin, G. 2009. Arbuscular Mycorrhizal Fungi in Two Mangroves in South China. Plant and Soil, 331: 181-191.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Wang, Z., Guo, D., Wang, X., Zhang, B., and Wang, B. 2018. How Does Information Publicity Influence Residents Behaviour Intentions Around E-Waste Recycling?. *Resources, Conservation and Recycling*, 133: 1-9.

Watts-Williams, S.J., Emmett, B.D., Levesque-Tremblay, V., MacLean, A.M., Sun, X., Satterlee, J.W., Fei, Z., and Harrison, M.J. 2018. Diverse *Sorghum bicolor* Accessions Show Marked Variation in Growth and Transcriptional Responses to Arbuscular Mycorrhizal Fungi. *Plant, Cell, and Environment*, 42(5): 1758-1774.

Wibowo, H.Y. dan Sitawati. 2017. Respons Tanaman Kangkung Darat (*Ipomea reptans* Poir) dengan Interval Penyiraman pada Pipa Vertikal. *Journal of Agricultural Science*, 2(2): 148-154.

Widiati, R., Idrus, M.I., dan Imran, A.N. 2015. Isolasi dan Identifikasi Mikoriza Vesikular Arbuskular (MVA) pada Rhizosfer Tanaman Jagung (*Zea mays* L.) di Desa Samangki Kecamatan Simbang Kabupaten Maros. *Agrokompleks*, 14(1): 55-60.

Widiati, R., Musa, Y., Ala, A., dan Farid, M.B. 2014. Stomatal Performance of Soybean Genotypes Due to Drought Stress and Acidity. *International Journal of Scientific & Technology Research*, 3(11): 270-275.

Wolf, S., Mravec, J., Greiner, S., Mouille, G., and Hofte, H. 2012. Plant Cell Wall Homeostasis is Mediated by Brassinosteroid Feedback Signaling. *Current Biology*, 22(18): 1732-1737.

Wu, H.H., Zou, Y.N., Rahman, M.M., Ni, Q.D., and Wu, Q.S. 2017. Mycorrhizas Alter Sucrose and Proline Metabolism in Trifoliate Orange Exposed to Drought Stress. *Scientific Reports*, 7: 4239.

Wu, Q.S. and Zou, Y.N. 2017. *Arbuscular Mycorrhizal Fungi and Tolerance of Drought Stress in Plants.* Singapore: Springer.

Wu, Q.S., Cao, M.Q., Zou, Y.N., Wu, C., and He, X.H. 2016. Mycorrhizal Colonization Represents Functional Equilibrium on Root Morphology and Carbon Distribution of Trifoliate Orange Grown in a Split-Root System. *Scientia Horticulturae*, 199: 95-102.

Wu, Q.S., Srivastava, A.K., and Zou, Y.N. 2013. AMF-induced Tolerance To Drought Stress in Citrus: A Review. *Scientia Horticulturae*, 164: 77-87.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Wu, T., Pan, L., Zipori, I., Mao, J., Li, R., Yongpeng, L., Yongjie, L., Jing, Y., and Haiyun, C. 2022. Arbuscular Mycorrhizal Fungi Enhanced the Growth, Phosphorus Uptake and Pht Expression of Olive (*Olea europaea* L.) Plantlets. *PeerJ*, 1-20.

Xinyi, Y., Meiqi, L., Yufei, W., Yiran, W., Zhijie, L., and Su C. 2021. Response Mechanism of Plants to Drought Stress. *Horticulture*, 7(50): 1-36.

Xu, Z. and Zhou, G. 2008. Responses of Leaf Stomatal Density to Water Status and its Relationship with Photosynthesis in a Grass. *Journal of Experimental Botany*, 59(12): 3317-3325.

Xue, R., Shen, T., and Marschner, P. 2017. Soil Water Content During and After Plant Growth Influence Nutrient Availability and Microbial Biomass. *Journal of Soil Science and Plant Nutrition*, 17(3): 702-715.

Yang, Q., Zhao, Z., Bai, Z., Hou, H., Yuan, Y., Guo, A., and Li, Y. 2019. Effects of Mycorrhizal and Water Conditions on Perennial Ryegrass Growth in Rare Earth Tailings. *RSC Advances*, 9(19): 10881-10888.

Yang, X., Lu, M., Wang, Y., Wang, Y., Liu, Z., and Chen, S. 2021. Response Mechanism of Plants to Drought Stress. *Horticulturae*, 7: 1-36.

Yooyongwech, S., Samphumphuang, T., Tisarum, R., Theerawitaya, C., and Chaum, S. 2016. Arbuscular Mycorrhizal Fungi (AMF) Improved Water Deficit Tolerance in Two Different Sweet Potato Genotypes Involves Osmotic Adjustments Via Soluble Sugar and Free Proline. *Scientia Horticulturae*, 198: 107-117.

Zagoto, A.D.P. 2019. Respon Anatomi Daun Beberapa Varietas *Oryza sativa* L. terhadap Cekaman Kekeringan di Sumatera Barat. Skripsi. *Tidak Dipublikasikan*. Universitas Negeri Padang.

Zare-Maivan, H., Khanpour-Ardestani, N., and Ghanati, F. 2015. Influence of Mycorrhizal Fungi on Growth, Chlorophyll Content, and Potassium and Magnesium Uptake in Maize. *Journal of Plant Nutrition*, 40(14).

Zeng, Y., Guo, L.P., Chen, B.D., Hao, Z.P., Wang, J.Y., Huang, L.Q., Yang, G., Cui, X.M., Yang, L., Wu, Z.X., Chen, M.L., and Zhang, Y. 2013. Arbuscular Mycorrhizal Symbiosis and Active Ingredients of Medicinal Plants: Current Research Status and Prospectives. *Mycorrhiza*, 23(4): 253-265.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhang, F., Zou, Y.N., and Wu, Q.S. 2018. Quantitative Estimation of Water Uptake by Mycorrhizal Extraradical Hyphae in Citrus Under Drought Stress. *Scientia Horticulturae,* 229: 132-136.

Zhang, F., Zou, Y.N., Wu, Q.S., and Kuca, K. 2020. Arbuscular Mycorrhizal Modulate Root Polyamine Metabolism to Enhance Drought Tolerance of Trifoliate Orange. *Environmental and Experimental Botany*, 171.

Zhang, Q., Peng, S., and Li, Y. 2019. Increase Rate of Light-Induced Stomatal Conductance is Related to Stomatal Size in the Genus *Oryza. Journal of Experimental Botany*, 70: 5259-5269.

Zhang, Z., Zhang, J., and Huang, Y. 2014. Effects of Arbuscular Mycorrhizal Fungi on the Drought Tolerance of *Cyclobalanopsis glauca* Seedlings Under Greenhouse Conditions. *New Forest*, 45: 545-556.

Zhao, W., Sun, Y., Kjelgren, R, and Liu, X. 2015. Response of Stomatal Density and Bound Gas Exchange in Leaves of Maize to Soil Water Deficit. *Acta Physiologiae Plantarum*, 37(1): 1704.

Zhou, R., Yu, X., Ottosen, C.O., Rosenqvist, E., Zhao, L., Wang, Y., Yu, W., Zhao, T., and Wu, Z. 2017. Drought Stress Had a Predominant Effect Over Heat Stress on Three Tomato Cultivars Subjected to Combined Stress. *BMC Plant Biology*, 17-24.

Zhu, J.K. 2016. Abiotic Stress Signaling and Responses in Plants. *Cell*, 167: 313-324.

Zhu, X., Cao, Q., Sun, L., Yang, X., Yang, W., and Zhang, H. 2018. Stomatal Conductance and Morphology of Arbuscular Mycorrhizal Wheat Plants Response to Elevated CO_2 and NaCl Stress. *Frontiers in Plant Science,* 9: 1-10.

Zhu, X., Song, F., and Liu, S. 2011. Arbuscular Mycorrhizal Impacts on Drought Stress of Maize Plants by Lipid Peroxidation, Proline Content and Activity of Antioxidant System. *Journal of Food, Agriculture and Environment*, 9(2): 583-587.

Zhu, X., Song, F., Liu, S.Q., Liu, T., and Xin, Z. 2012. Arbuscular Mycorrhizal Improves Photosynthesis and Water Status of *Zea mays* L. Under Drought Stress. *Plant, Soil and Environment,* 58(4): 186-191.

UNIVERSITAS
GADJAH MADA
Pertumbuhan, Respons Fisiologis dan Anatomis Tanaman Sawi Hijau (Brassica juncea L.) terhadap Aplikasi Mikoriza Vesikular Arbuskular (MVA) pada Kondisi Kekeringan
Rizqi Aulia Nurlaili, Prof. Dr. Diah Rachmawati, S.Si., M.Si.
Universitas Gadjah Mada, 2023 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhu, X.Q., Tang, M., and Zhang, H.Q. 2017. Arbuscular Mycorrhizal Fungi Enhanced the Growth, Photosynthesis, and Calorific Value of Black Locust Under Salt Stress. *Photosynthetica*, 55: 378-385.