DAFTAR PUSTAKA

Agus, C., Hendryan, A., Harianja, V., Faridah, E., Atmanto, W.D., Cahyanti, P.A.B., Wulandaric, D., Pertiwiningrum, A., Suhartanto, B., Bantara, I., Hutahaean, B.P., Suparto, B., and Lestarii, T., 2019, Role of Organic Soil Amendment Of Paramagnetic Humus and Compost for Rehabilitation of Post Tin-Mined Tropical Land, *SGCE*, 8, 556–561.

Agus, C., Kusuma, M.G.C.A., Faridah, E., Dina, A., Wulandari, D., Bantara, I., Hutahaean, B.P., and Lestari T., 2020, Paramagnetic Humus and Callophylllum Inophyllum for Rehabilitation of Tropical Anthropogenic Deserted Tin-mined Soil, *IJAST*, 29(7), 2931–2941.

Ahaduzzaman, M., Milan, L., Morton, C.L., Gerber, P.F., and Walkden-Brown, S.W., 2021, Characterization of Poultry House Dust Using Chemometrics and Scanning Electron Microscopy Imaging, *Poult. Sci*., 7 (100), 188.

Ahmed, N., Zhang, B., Chachar, Z., Li, J., Xiao, G., Wang, Q., Hayat, F., Deng, L., Narejo, M. un N., Bozdar, B., and Tu, P., 2024, Micronutrients and Their Effects on Horticultural Crop Quality, Productivity, and Sustainability, *Sci Hortic*, 323, .

Angelico, R., Colombo, C., Di Iorio, E., Brtnický, M., Fojt, J., and Conte, P., 2023, Humic Substances: From Supramolecular Aggregation to Fractal Conformation—Is There Time for a New Paradigm, *Applied Sciences (Switzerland)*, 13, 13-14.

Angin, I., Aksakal, E. L., Oztas, T., Hanay, A., 2013, Effects of Municipal Solid Waste Compost (Mswc) Application on Certain Physical Properties of Soils Subjected to Freeze-Thaw, *Soil Till Res.*, 130, 58-61.

Armita, D., Wahdaniyah., Hafsan., Amanah., H. A., 2022., Diagnosis Visual Masalah Unsur Hara Esensial Pada Berbagai Jenis Tanaman, *Teknosains: Media Informasi Sains dan Teknologi*., 17 (1), 139-150.

Badan Pusat Statistik, 2023, *Proyeksi Penduduk Indonesia 2020-2050*, Subdirektorat Statistik Demografi BPS, Jakarta.

Bouis, H.E. and Welch, R.M., 2010, Biofortification—A Sustainable Agricultural Strategy for Reducing Micronutrient Malnutrition in The Global South, *Crop Sci*, 50, 20-32.

Chang, R.R., Mylotte, R., Hayes, M.H.B., McLnerney, R., and Tzou, Y.M., 2014, A Comparison of The Compositional Differences Between Humic Fractions Isolated by The IHSS and Exhaustive Extraction Procedures, *Naturwissenschaften*, 101, 197–209.

Chorover, J., and Brusseau, M. L., 2008, Kinetics of Water-Rock Interaction, *Springer*, New York.

Dhaliwal, S.S., Sharma, V., Shukla, A.K., Verma, V., Kaur, M., Shivay, Y.S., Nisar, S., Gaber, A., Brestic, M., Barek, V., Skalicky, M., Ondrisik, P., and Hossain, A.,

2022, Biofortification—A Frontier Novel Approach to Enrich Micronutrients in Field Crops to Encounter the Nutritional Security, *Molecules*, 27.

D'Hose,T., Cougnon,M., Vliegher, A.D., Vandecasteele, B., Viaene, N., Cornelis, W., Bockstaele, E.V., Reheul, D., 2012, The Positive Relationship Between Soil Quality and Crop Production, A Case Study on the Effect Of Farm Compost Application, *Appl. Soil Ecol.*, 75, 189-198.

De Melo, B. A. G., Motta, F. L., and Santana, M. H. A., 2016, Humic acids: Structural Properties and Multiple Functionalities for Novel Technological Developments, *Mater. Sci. Eng.*, 62, 967–974.

Dimkpa, C.O. and Bindraban, P.S., 2016, Fortification of Micronutrients for Efficient Agronomic Production: A Review, *Agron. Sustain. Dev.*, 36, 1–26.

Efremenko, E., Stepanov, N., Senko, O., Lyagin, I., Maslova, O., and Aslanli, A., 2023, Artificial Humic Substances as Biomimetics of Natural Analogues: Production, Characteristics and Preferences Regarding Their Use, *Biomimetics*, 8.

Fan, J., Ding, W., Xiang, J., Qin, S., Zhang, J., Ziadi, N., 2014, Carbon Sequestration in an Intensively Cultivated Sandy Loam Soil in The North China Plain as Affected by Compost and Inorganic, *Geoderma*, 230-231, 22-28.

Guo, L., Sun, C.M., Li, G.Y., Liu, C.P., and Ji, C.N., 2009, Thermodynamics and Kinetics of Zn(II) Adsorption on Crosslinked Strach Phosphates, *J. Haz. Mat.*, 161(1), 510-515.

Halpern, M., Bar-Tal, A., Ofek, M., Minz, D., Muller, T., and Yermiyahu, U., 2015, The Use of Biostimulants for Enhancing Nutrient Uptake, *Advances in Agronomy*, 130, 141–174.

Han, X., Wang, W., and Ma, X., 2011, Adsorption Characteristics of Methylene Blue onto Low Cost Biomass Material Lotus Leaf, *J. Chem. Eng.*, 171, 1-8.

Handayani, N., Purnomo, J., and Nazari, Yu. A., 2020, Pengaruh Pemberian Takaran Abu Sekam Padi Pada Tanah Gambut Terhadap Pertumbuhan dan Hasil Pakcoy, *Agroekotek View*, 3(2), 37–42.

Hashemian, S., Karimi, A.M., and Salehifar, H., 2013, Kinetics and Thermodynamics of Adsorption Methylene Blue onto Tea Waste/CuFe2O4 Composite, *Americ. J. Analy. Chem.*, 4, 1-7.

Hayes, M.H., SwiftB, R.S., MByrnè, C., and Simpsonc, A.J., 2010, The Isolation and Characterization of Humic Substances and Humin from Grey Brown Podzolic and Gley Grassland Soils.

Ickowitz, A., Rowland, D., Powell, B., Salim, M.A., and Sunderland, T., 2016, Forests, Trees, and Micronutrient-Rich Food Consumption in Indonesia, *PLoS One*, 11.

Imtiaz, M., Scientist, A., Rashid, A., and Aslam, M., 2010, The Role of Micronutrients in Crop Production and Human Health, *Article in Pakistan Journal of Botany*, 174, 782.

Isarankura, S., Ayutthaya, N., and Tanpichai, S., 2015, Keratin Extracted from Chicken Feather Waste : Extraction, Preparation, and Structural Characterization of the Keratin and Keratin / Biopolymer Films and Electrospuns, *J. Polym. Environ*., 23, 506–516.

Khan, A., Ul-Haq, Z., Fatima, S., Ahmed, J., Alobaid, H.M., Fazid, S., Muhammad, N., Garzon, C., Ihtesham, Y., Habib, I., Tanimoune, M., Iqbal, K., Arshad, M., and Safi, S.Z., 2023, Long-Term Impact of Multiple Micronutrient Supplementation on Micronutrient Status, Hemoglobin Level, and Growth in Children 24 to 59 Months of Age: A Non-Randomized Community-Based Trial from Pakistan, *Nutrients*, 15.

Khosravi, A., Zheng, H., Liu, Q., Hashemi, M., Tang, Y., and Xing, B., 2022, Production and characterization of hydrochars and their application in soil improvement and environmental remediation, *Chemical Engineering Journal*, 430.

Kordi, M., Farrokhi, N., Pech-Canul, M.I., and Ahmadikhah, A., 2024, Rice Husk at a Glance: From Agro-Industrial to Modern Applications, *Rice Sci*, 31, 14–32.

Korotkova, T.G., Ksandopulo, S.J., Donenko, A.P., Bushumov, S.A., and Danilchenko, A.S., 2016, Physical properties and chemical composition of the rice husk and dust, *Oriental Journal of Chemistry*, 32, 3213–3219.

Kuncaka, A., 2014, Metode Memproduksi Pupuk Organik Paramagnetik Pelepasan Lambat (Slow Release Organic Paramagnetic), *Paten Indonesia*, P00201401530.

Kuncaka, A., 2013, Slow Release Organic Paramagnetic (SROP) Fertilizer sebagai Model Humus Sintetis untuk Mengantarkan Terwujudnya Industri Pertanian Raksasa Nasional yang Berkelanjutan, *Pidato Dies Natalis Universitas Gadjah Mada ke-58 Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Gadjah Mada*, 19 Desember 2013, Yogyakarta.

Kuncaka, A., Supardi, W. T., Haryadi, W., Suratman, A., and Priatmoko, P., 2023, Enhancing the Amino Acid and Reducing the Metal Ions Contents in the Hydrolysate Resulting from Hydrothermal Carbonization of Chicken Feather Waste by Chemical Phosphorylation, *Indones. J. Chem*., 23(1), 278-284.

Lehmann, J., 2009, Terra Preta de Indio, *Encyc. Of Soil Sci*., 1, 1-4.

Li, J., Dong, X., Liu, X., Xu, X., Duan, W., Park, J., Gao, L., and Lu, Y., 2022, Comparative Study on the Adsorption Characteristics of Heavy Metal Ions by Activated Carbon and Selected Natural Adsorbents, *Sustainability (Switzerland)*, 14.

Lindner, T., Bonebeau, S., Drehmann, R., Grund, T., Pawlowski, L., and Lampke, T., 2016, Analytical methods to characterize heterogeneous raw material for thermal spray process: Cored wire Inconel 625,. In, *IOP Conference Series: Materials Science and Engineering*. Institute of Physics Publishing.

Masunaga, T. and Marques Fong, J.D., 2018, Strategies for Increasing Micronutrient Availability in Soil for Plant Uptake,. In, *Plant Micronutrient Use Efficiency: Molecular and Genomic Perspectives in Crop Plants*. Elsevier, pp. 195–208.

Miyasto., 2014, Startegi Ketahanan Pangan Nasional Guna Meningkatkan Kemandirian dan Daya Saing Ekonomi dalam Rangka Ketahanan Nasional, *Jurnal Kajian Lemhas RI*, 17, 17-34.

Mossa, A.W., Gashu, D., Broadley, M.R., Dunham, S.J., McGrath, S.P., Bailey, E.H., and Young, S.D., 2021, The effect of soil properties on zinc lability and solubility in soils of Ethiopia - An isotopic dilution study, *SOIL*, 7, 255–268.

Nahar, N., Khan, S.K., and Hossain, Z., 2024, Impact of Rice Husk Ash on the Compaction Characteristics of Soil, *Jagannath University Journal of Science*, 10, 87–93.

Nardi, S., Schiavon, M., and Francioso, O., 2021, Chemical Structure and Biological Activity of Humic Substances Define Their Role As Plant Growth Promoters, *Molecules*, 26.

Novotny, E. H., Hayes, M. H. B., Madari, B. E., Bonogamba, T. J., deAzevedo, E. R., deSouza, A. A., Song, G., Nogueira, C. M., Mangrich, A. S., 2009, Lesson from the *Terra Preta de Indios* of the Amazon Region for the Utilisation of Charcoal for Soil Amenment, *J. Braz. Chem. Soc.*, 20, 1003-1010.

Nyoman Rupiasih, Ni, Nyoman Rupiasih, N, and Vidyasagar, P.B., 2005, Pandit Vidyasagar A Review: Compositions, Structures, Properties and Applications of Humic Substances.

Pan, D., Wu, X., Chen, P., Zhao, Z., Fan, F., Wang, Youxue, Zhu, M., Xue, J., and Wang, Yi, 2021, New Insights Into The Interactions Between Humic Acid and Three Neonicotinoid Pesticides, with Multiple Spectroscopy Technologies, Two-Dimensional Correlation Spectroscopy Analysis and Density Functional Theory, *Science of the Total Environment*, 798.

Petrović, J., Ercegović, M., Simić, M., Koprivica, M., Dimitrijević, J., Jovanović, A., and Janković Pantić, J., 2024, Hydrothermal Carbonization of Waste Biomass: A Review of Hydrochar Preparation and Environmental Application, *Processes*, 12.

Pode R. 2016. Potential applications of rice husk ash waste from rice husk biomass power plant, *Renewable and Sustainable Energy Reviews*, 53, 1468-1485.

Poh, B. K., Ng, B. K., Haslinda, M. D. S., Shanita, S. N., Wong, J. E., Budin, S. B., and Norimah, A. K., 2013, Nutritional status and dietary intakes of children aged 6 months to 12 years: findings of the Nutrition Survey of Malaysia Children (SEANUTS Malaysia), *Br. J. Nutr.*, 110(S3), 21-35.

Qiu, H., Lv, L., and Pan, B.C., Zhang, Q.J., Zhang, W.M., and Zhang, Q.X., 2009, Critical Review in Adsorption Kinetic Models, *J. Zhej. Univ. Sci. A.*, 10, 716-724.

Rengel, Z., 2015, Availability of Mn, Zn and Fe in The Rhizosphere.

Saranya, P., Sri Gayathiri, C.M., and Sellamuthu, K.M., 2018, Potential Use of Rice Husk Ash for Enhancing Growth of Maize (Zea mays), *Int. J. Curr. Microbiol. Appl. Sci.*, 7, 899–906.

Severo, F. F., 2020, Chemical and Physical Characterization of Rice Husk Biochar and Ashes and Their Iron Absorption Capacity, SN Appl. Sci., 2, 1286.

Sinkiewicz, I., 2017, Alternative Methods of Preparation of Soluble Keratin from Chicken Feathers, Waste Biomass Valorization, 8, 1043-1048.

Smejkalova, D., Piccolo, A., 2008, Host-Guest Interactions between 2,4 Dichlorophenol and Humic Substances as Evaluated by ^{1}H NMR Relaxation and Diffusion Ordered Spectroscopy, *Environ. Sci. Technol., 42*, 699– 706.

Sodhi, G. P. S., Beri, V., Benbi, D. K., 2008, Soil Aggregation and Distribution of Carbon and Nitrogen in Different Fractions under Long-Term Application of Compost in Rice-Wheat System, *Soil Till. Res.*, 103, 412-418.

Stancampiano, L.M., Verrillo, M., Cangemi, S., Meignant, I., Spaccini, R., Piccolo, A., and Bridoux, M.C., 2023, The Molecular Composition of Humic Substances Extracted From Green Composts and Their Potential for Soil Remediation, *Environ. Chem. Lett.*, 21, 2489–2498.

Stepien, A. and Wojtkowiak, K., 2016, Effect of Foliar Application of Cu, Zn, And Mn on Yield and Quality Indicators of Winter Wheat Grain, *Chil. J. Agric. Res.*, 76, 220–227.

Stevenson, F.J., 1994, *Humus Chemistry: Genesis, Composition, Reaction, 2 Ed.*, John Wiley & Sons, New York.

Strutt, A., 2009, Indonesia in A Reforming World Economy, *CASER*, Bogor.

Thapa, S., Bhandari, A., Ghimire, R., Xue, Q., Kidwaro, F., Ghatrehsamani, S., Maharjan, B., and Goodwin, M., 2021, Managing micronutrients for improving soil fertility, health, and soybean yield, *Sustainability (Switzerland)*, 13.

Vetterlein, D., Kuhn, T., Kaiser, K., and Jahn, R., 2013, Illite Transformation and Potassium Release upon Changes in Composition of the Rhizophere Soil Solution, Plant Soil, 371, 267-279.

Wang, T., Zhai, Y., Zhu, Y., Li, C., and Zeng, G., 2018, A review of The Hydrothermal Carbonization of Biomass Waste for Hydrochar Formation: Process Conditions, Fundamentals, and Physicochemical Properties, *Renewable and Sustainable Energy Reviews*, 90, 223–247.

Wasay, S.A., Barrington, S.F., Tokunaga, S., and Prasher, S., 2007, Kinetics of Heavy Metal Desorption from Three Soils using Citric Acid, Tartaric Acid, and EDTA, *J. Environ. Eng. Sci.*, 6, 611-622.

Wei, C., Aqlima, S., Toung, P., and Yee, L., 2017, Treatments of Chicken Feather Waste, Pertanika Journal of Scholarly Research Reviews, 3(1), 32-41.

Yang, F., Zhang, S., Cheng, K., and Antonietti, M., 2019, A Hydrothermal Process to Turn Waste Biomass Into Artificial Fulvic and Humic Acids for Soil Remediation, *Science of the Total Environment*, 686, 1140–1151.

Zhang, S., Wen, J., Hu, Y., Fang, Y., Zhang, H., Xing, L., Wang, Y., and Zeng, G., 2019, Humic Substances from Green Waste Compost: An Effective Washing Agent for Heavy Metal (Cd, Ni) Removal from Contaminated Sediments, *J. Hazard. Mater.*, 366, 210-218.