

## DAFTAR PUSTAKA

- Abdullah, J.A.A., Perdomo, C.A.A., Núñez, L.A.H., Rivera-Flores, O., Sánchez-Barahona, M., Guerrero, A., Romero, A., 2024. Lychee peel extract-based magnetic iron oxide nanoparticles: Sustainable synthesis, multifaceted antioxidant system, and prowess in eco-friendly food preservation. *Food and Bioproducts Processing* 145, 148–157. <https://doi.org/10.1016/j.fbp.2024.03.007>
- Ahdour, A., Taoufyq, A., Aneflous, L., Bakiz, B., Benhachemi, A., 2024. Electrocatalytic and photoelectrocatalytic investigation of Orange G degradation utilizing a novel BHP@Bi<sub>2</sub>O<sub>3</sub> photoanode employing the CCD-RSM experimental design. *Journal of Electroanalytical Chemistry* 963. <https://doi.org/10.1016/j.jelechem.2024.118317>
- Aida, T.M., Kumagai, Y., Smith, R.L., 2022. Mechanism of selective hydrolysis of alginates under hydrothermal conditions. *Journal of Bioresources and Bioproducts* 7, 173–179. <https://doi.org/10.1016/j.jobab.2022.04.001>
- Ali, S.S., Alsharbaty, M.H.M., Al-Tohamy, R., Schagerl, M., Al-Zahrani, M., Kornaros, M., Sun, J., 2025. Microplastics as persistent and vectors of other threats in the marine environment: Toxicological impacts, management and strategical roadmap to end plastic pollution. *Environmental Chemistry and Ecotoxicology* 7, 229–251. <https://doi.org/10.1016/j.enceco.2024.12.005>
- Angel Agnes, J., Sajitha, D.R., Beauno, S., Selvaraj, M., Thankaraj Salammal, S., 2025. Efficient mechanochemical studies of Cu<sub>2</sub>FeSnSe<sub>4</sub> quaternary chalcogenide for energy conversion and storage applications. *Inorg Chem Commun* 173. <https://doi.org/10.1016/j.inoche.2024.113881>
- Anugrahwidya, R., Armynah, B., Tahir, D., 2021. Bioplastics Starch-Based with Additional Fiber and Nanoparticle: Characteristics and Biodegradation Performance: A Review. *J Polym Environ.* <https://doi.org/10.1007/s10924-021-02152-7>
- avanakumar, S.S., 2021. Characterization of Ecofriendly Poly and Green Banana Peel Filler (GBPF) Reinforced Bio-Films. *J Polym Environ.* 29, 2756–2771. <https://doi.org/10.1007/s10924-021-02056-y>
- er, R., El-Bagoury, M., Shaker, I., Attia, A.M., Elhenawy, Y., 2025. Integrating medical plastic waste pyrolysis and circular



- economy for environmental sustainability. *Renewable and Sustainable Energy Reviews*. <https://doi.org/10.1016/j.rser.2024.115062>
- Boschi, A., Scieuzo, C., Salvia, R., Arias, C.F., Perez, R.P., Bertocchini, F., Falabella, P., 2024. Beyond Microbial Biodegradation: Plastic Degradation by *Galleria mellonella*. *J Polym Environ* 32, 2158–2177. <https://doi.org/10.1007/s10924-023-03084-6>
- Cai, Z., Li, M., Zhu, Z., Wang, X., Huang, Y., Li, T., Gong, H., Yan, M., 2023. Biological Degradation of Plastics and Microplastics: A Recent Perspective on Associated Mechanisms and Influencing Factors. *Microorganisms*. <https://doi.org/10.3390/microorganisms11071661>
- Chandrasekar, C.M., Krishnamachari, H., Farris, S., Romano, D., 2023. Development and characterization of starch-based bioactive thermoplastic packaging films derived from banana peels. *Carbohydrate Polymer Technologies and Applications* 5. <https://doi.org/10.1016/j.carpta.2023.100328>
- Chen, Z., Li, P., Ji, Q., Xing, Y., Ma, X., Xia, Y., 2023. All-polysaccharide composite films based on calcium alginate reinforced synergistically by multidimensional cellulose and hemicellulose fractionated from corn husks. *Mater Today Commun* 34. <https://doi.org/10.1016/j.mtcomm.2022.105090>
- Chen, Z., Liu, R., Wei, Y., Li, B., Luo, W., Zhu, X., Huang, C., 2024. A novel strategy to transform mango peel waste into useful product—Preparing antibacterial film containing tea polyphenols for chicken breast preservation. *LWT* 197. <https://doi.org/10.1016/j.lwt.2024.115933>
- Cortés-Triviño, E., Valencia, C., Franco, J.M., Oliva, J.M., Manzanares, P., Eugenio, M.E., Ibarra, D., 2024. Assessment of Lignin Residues from Bioethanol Production of Olive Stones as Green Chemical Thickener of Epoxidized Linseed Oil. *J Polym Environ* 32, 4507–4524. <https://doi.org/10.1007/s10924-024-03216-6>
- Dalal, S.R., El-Naggar, N.E.A., El Naeem, G.A., 2023. Biosynthesis of sustainable bioplastics using alginate extracted from *Padina pavonica*, and characterization. *Algal Res* 76. <https://doi.org/10.1016/j.algal.2023.103325>
- H., Dominici, F., Ferri, J.M., Luzi, F., Puglia, D., Torre, L., López-mpfer, M.D., 2023. Pentaerythritol and Glycerol Esters Derived as Bio-Based Additives for the Improvement of Processability



- and Thermal Stability of Polylactic Acid. *J Polym Environ* 31, 5446–5461. <https://doi.org/10.1007/s10924-023-02949-0>
- Donati, I., Christensen, B.E., 2023. Alginate-metal cation interactions: Macromolecular approach. *Carbohydr Polym.* <https://doi.org/10.1016/j.carbpol.2023.121280>
- Dutta, D., Sit, N., 2024. Preparation and characterization of potato starch-based composite films reinforced by modified banana fibers and its application in packaging of grapes. *Int J Biol Macromol* 254. <https://doi.org/10.1016/j.ijbiomac.2023.127791>
- Eslami, Z., Elkoun, S., Robert, M., Adjallé, K., 2023. A Review of the Effect of Plasticizers on the Physical and Mechanical Properties of Alginate-Based Films. *Molecules.* <https://doi.org/10.3390/molecules28186637>
- Espinosa, E., Rincón, E., Morcillo-Martín, R., Rabasco-Vílchez, L., Rodríguez, A., 2022. Orange peel waste biorefinery in multi-component cascade approach: Polyphenolic compounds and nanocellulose for food packaging. *Ind Crops Prod* 187. <https://doi.org/10.1016/j.indcrop.2022.115413>
- Fiore, V., Badagliacco, D., Sanfilippo, C., Pirrone, R., Siengchin, S., Rangappa, S.M., Botta, L., 2022. Lemongrass Plant as Potential Sources of Reinforcement for Biocomposites: A Preliminary Experimental Comparison Between Leaf and Culm Fibers. *J Polym Environ* 30, 4726–4737. <https://doi.org/10.1007/s10924-022-02545-8>
- Firdaus, S., Ahmad, F., Zaidi, S., 2024. Preparation and characterization of biodegradable food packaging films using lemon peel pectin and chitosan incorporated with neem leaf extract and its application on apricot fruit. *Int J Biol Macromol* 263. <https://doi.org/10.1016/j.ijbiomac.2024.130358>
- Gabriele, F., Vetrano, A., Bruno, L., Casieri, C., Germani, R., Rugnini, L., Spreti, N., 2021. New oxidative alginate-biocide hydrogels against stone biodeterioration. *Int Biodeterior Biodegradation* 163. <https://doi.org/10.1016/j.ibiod.2021.105281>
- Q.S., 2025. Ecologically sustainable biodegradable polymers banana peel pectin reinforced with silver zeolite nanoparticles (NPs). *Int J Biol Macromol* 300. <https://doi.org/10.1016/j.ijbiomac.2025.140209>



- Goel, V., Luthra, P., Kapur, G.S., Ramakumar, S.S.V., 2021. Biodegradable/Bio-plastics: Myths and Realities. *J Polym Environ*. <https://doi.org/10.1007/s10924-021-02099-1>
- Gopalakrishnan, K., Ahmed, S., Mishra, P., 2024. Effect of aminolysis treatment on self-healing properties and printing potentialities of banana peel and edible wax based biodegradable film. *Int J Biol Macromol* 282. <https://doi.org/10.1016/j.ijbiomac.2024.136805>
- Gu, J.D., Ford, T., Mitton, B., Mitchell, R., 2024. Research on biodeterioration of plastics. *Int Biodeterior Biodegradation* 186. <https://doi.org/10.1016/j.ibiod.2023.105699>
- Gündoğdu, S., Bour, A., Köşker, A.R., Walther, B.A., Napierska, D., Mihai, F.C., Syberg, K., Hansen, S.F., Walker, T.R., 2024. Review of microplastics and chemical risk posed by plastic packaging on the marine environment to inform the Global Plastics Treaty. *Science of the Total Environment* 946. <https://doi.org/10.1016/j.scitotenv.2024.174000>
- Han, Y., Wang, R., Wang, D., Luan, Y., 2024. Enzymatic degradation of synthetic plastics by hydrolases/oxidoreductases. *Int Biodeterior Biodegradation* 189. <https://doi.org/10.1016/j.ibiod.2024.105746>
- Herburger, K., Franková, L., Sanhueza, D., Roig-Sanchez, S., Meulewaeter, F., Hudson, A., Thomson, A., Laromaine, A., Budtova, T., Fry, S.C., 2020. Enzymically attaching oligosaccharide-linked 'cargoes' to cellulose and other commercial polysaccharides via stable covalent bonds. *Int J Biol Macromol* 164, 4359–4369. <https://doi.org/10.1016/j.ijbiomac.2020.09.039>
- Hernando, H., Marpongahtun, Julianti, E., Nuryawan, A., Amaturrahim, S.A., Piliang, A.F.R., Yanhar, M.R., Goei, R., Soykeabkaew, N., Saputra, A.M.A., Gea, S., 2024. Impact of glycerol on oil palm trunk starch bioplastics enhanced with citric-acid epoxidized palm oil oligomers. *Case Studies in Chemical and Environmental Engineering* 10. <https://doi.org/10.1016/j.cscee.2024.100839>
- ny, S., 2024. Biodegradable packaging films from banana peel *rem Pharm* 37. <https://doi.org/10.1016/j.scp.2023.101400>
- L., Wang, Z., Tong, H., 2024. Biodegradation of polybutylene n extracellular esterase from *Pseudomonas mendocina*. *Int degradation* 195. <https://doi.org/10.1016/j.ibiod.2024.105910>



- Jangong, O.S., Heryanto, H., Rahmat, R., Mutmainna, I., Gareso, P.L., Tahir, D., 2021. Effect of Sugar Palm Fiber (SPF) to the Structural and Optical Properties of Bioplastics (SPF/Starch/Chitosan/Polypropylene) in supporting Mechanical Properties and Degradation Performance. *J Polym Environ* 29, 1694–1705. <https://doi.org/10.1007/s10924-020-02019-9>
- Kadell, M.Y.Z.K., Callychurn, D.S., 2023. An investigation on the use algae-based material for the production of reusable bioplastic bags: A Mauritian case study. *Cleaner Materials* 9. <https://doi.org/10.1016/j.clema.2023.100201>
- Kalam, A., Al-Sehemi, A.G., Allami, S.A.S., Ashrafuzzaman, M., Yadav, P., Du, G., 2024. Study of Pure and Mixed-Phase TiO<sub>2</sub> Nanomaterials Synthesized via a Modified Solvothermal Method and Their Optical Properties. *Journal of the Indian Chemical Society* 101. <https://doi.org/10.1016/j.jics.2024.101460>
- Khan, H., Raghuvanshi, S., Saroha, V., Singh, S., Baba, W.N., Mudgil, P., Dutt, D., 2023. Biotransformation of banana peel waste into bacterial nanocellulose and its modification for active antimicrobial packaging using polyvinyl alcohol with in-situ generated silver nanoparticles. *Food Packag Shelf Life* 38. <https://doi.org/10.1016/j.fpsl.2023.101115>
- Kim, H.H., Kim, B.J., 2024. Thermal degradation behavior and decomposition mechanism of thermoset plastic for carbon fiber-reinforced plastic recycling under varied process conditions. *Chemical Engineering Journal* 493. <https://doi.org/10.1016/j.cej.2024.152407>
- Kiran V, G., Varsha A, K., M, V., Govindaraj, V., M, A., N, V., M, G., Nithila, E.E., Bebin, M., Prasath, T.A., Chezhiyan, P., 2022. Synthesis and Characterization of Banana Peel Starch-based Bioplastic for Intravenous Tubes Preparation. *Mater Today Commun* 33. <https://doi.org/10.1016/j.mtcomm.2022.104464>
- Kouchakinejad, R., Lotfi, Z., Golzary, A., 2024. Exploring Azolla as a sustainable feedstock for eco-friendly bioplastics: A review. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2024.e39252>
- Chakma, S., 2024. Influence of banana peel waste biomass pyrolysis of waste plastics to regulate aromatic content and compounds: A study of liquid product characterization and its performance. *Journal of the Energy Institute* 117. <https://doi.org/10.1016/j.joei.2024.101803>



- Kumar, V., Chakraborty, P., Janghu, P., Umesh, M., Sarojini, S., Pasrija, R., Kaur, K., Lakkaboyana, S.K., Sugumar, V., Nandhagopal, M., Sivalingam, A.M., 2023. Potential of banana based cellulose materials for advanced applications: A review on properties and technical challenges. *Carbohydrate Polymer Technologies and Applications* 6. <https://doi.org/10.1016/j.carpta.2023.100366>
- Lai, J., Huang, H., Lin, M., Xu, Y., Li, X., Sun, B., 2023. Enzyme catalyzes ester bond synthesis and hydrolysis: The key step for sustainable usage of plastics. *Front Microbiol.* <https://doi.org/10.3389/fmicb.2022.1113705>
- Li, Z., Liu, H., Liao, Y., Wang, H., Sun, X., Chen, X., Yan, H., Lin, Q., 2023. Design and properties of alginate/gelatin/cellulose nanocrystals interpenetrating polymer network composite hydrogels based on in situ cross-linking. *Eur Polym J* 201. <https://doi.org/10.1016/j.eurpolymj.2023.112556>
- Lin, Z., Jin, T., Xu, X., Yin, X., Zhang, D., Geng, M., Pang, C., Luo, G., Xiong, L., Peng, J., Fei, J., 2024. Screening and degradation characteristics of plastic-degrading microorganisms in film-mulched vegetable soil. *Int Biodeterior Biodegradation* 186. <https://doi.org/10.1016/j.ibiod.2023.105686>
- Lounis, F.M., Benhacine, F., Hadj-Hamou, A.S., 2024. Improving water barrier properties of starch based bioplastics by lignocellulosic biomass addition: Synthesis, characterization and antibacterial properties. *Int J Biol Macromol* 283. <https://doi.org/10.1016/j.ijbiomac.2024.137823>
- Majamo, S.L., Amibo, T.A., 2024. Study on extraction and characterization of anchote (*Coccinia abyssinica*) starch and reinforced enset (*Ensete ventricosum*) fiber for the production of reinforced bioplastic film. *Heliyon* 10. <https://doi.org/10.1016/j.heliyon.2023.e23098>
- Mao, L., Zuo, J., Liu, Yujie, Zheng, B., Dai, X., Bai, Z., Liu, Yulin, Yao, J., 2023. Alginate based films integrated with nitrogen-functionalized carbon dots and layered clay for active food packaging applications. *Int J Biol Macromol* 253. <https://doi.org/10.1016/j.ijbiomac.2023.126653>



Manimaran, P., Sanjay, M.R., Siengchin, S., Geetha, M., aran, K., Boonyasopon, P., Gorbatyuk, S., 2022. Extraction and starch-based bioplastics from *Prosopis Juliflora* Plant: Eco-tainability aspects. *Current Research in Green and Sustainable* <https://doi.org/10.1016/j.crgsc.2022.100296>

- Martínez-Cano, B., Mendoza-Meneses, C.J., García-Trejo, J.F., Macías-Bobadilla, G., Aguirre-Becerra, H., Soto-Zarazúa, G.M., Feregrino-Pérez, A.A., 2022. Review and Perspectives of the Use of Alginate as a Polymer Matrix for Microorganisms Applied in Agro-Industry. *Molecules*. <https://doi.org/10.3390/molecules27134248>
- Medeiros Silva, V.D., Coutinho Macedo, M.C., Rodrigues, C.G., Neris dos Santos, A., de Freitas e Loyola, A.C., Fante, C.A., 2020. Biodegradable edible films of ripe banana peel and starch enriched with extract of *Eriobotrya japonica* leaves. *Food Biosci* 38. <https://doi.org/10.1016/j.fbio.2020.100750>
- Ming Yan, J.S.S.T.G.Z.J.Z.Y.Z.H.Z.Y.Y.J.G., 2021. Design for dynamic hydrogen bonding in a double network structure to improve the mechanical properties of sodium alginate fibers. *New Journal of Chemistry* 45, 20329–20341.
- Mohammed, A., Gaduan, A., Chaitram, P., Pooran, A., Lee, K.Y., Ward, K., 2023. Sargassum inspired, optimized calcium alginate bioplastic composites for food packaging. *Food Hydrocoll* 135. <https://doi.org/10.1016/j.foodhyd.2022.108192>
- Nizamuddin, S., Baloch, A.J., Chen, C., Arif, M., Mubarak, N.M., 2024. Bio-based plastics, biodegradable plastics, and compostable plastics: biodegradation mechanism, biodegradability standards and environmental stratagem. *Int Biodeterior Biodegradation*. <https://doi.org/10.1016/j.ibiod.2024.105887>
- Nyerere, G., Kyokusiima, S., Nabaterega, R., Tumusiime, G., Kavuma, C., 2024. The synergy of maize straw cellulose and sugarcane bagasse fibre on the characteristics of bioplastic packaging film. *Bioresour Technol Rep* 28. <https://doi.org/10.1016/j.biteb.2024.102007>
- Ranote, S., Kowalczyk, M., Guzenko, N., Duale, K., Chaber, P., Musioł, M., Jankowski, A., Marcinkowski, A., Kurcok, P., Chauhan, G.S., Chauhan, S., Kumar, K., 2024. Towards scalable and degradable bioplastic films from *Moringa oleifera* gum/poly(vinyl alcohol) as packaging material. *Int J Biol Macromol* 269. <https://doi.org/10.1016/j.ijbiomac.2024.132219>
- Tomazetto, G., Foltran, B.B., Galvão, M.H., Tramontina, R., de Almeida Rodrigues, F., da Silva, L.S., Fernandes, D.G. da S., Almeida, D.V., Baldo, D.A., de Oliveira Arcia, W., Damasio, A., Squina, F.M., 2024. Plastic-degrading communities reveal novel microorganisms, pathways, and



- biocatalysts for polymer degradation and bioplastic production. *Science of the Total Environment* 949. <https://doi.org/10.1016/j.scitotenv.2024.174876>
- Safira, N.P., Heryanto, H., Tahir, D., Syam, F., Akouibaa, A., 2024. Development and characterization of cornstarch-based bioplastics: Influence of fructose concentration and titanium dioxide (TiO<sub>2</sub>) variations on structural, chemical bonding, and nutrient-related properties of mung bean plants. *Int J Biol Macromol* 283. <https://doi.org/10.1016/j.ijbiomac.2024.137852>
- Shuprajhaa, T., Paramasivam, S.K., Pushpavalli, S., Anandakumar, S., Naik, R., 2025. Influence of additives on the development, mechanical, functional characteristics and biodegradability of banana starch-based bio plastic films. *Int J Biol Macromol* 295. <https://doi.org/10.1016/j.ijbiomac.2025.139544>
- Sul, Y., Ezati, P., Rhim, J.W., 2023. Preparation of chitosan/gelatin-based functional films integrated with carbon dots from banana peel for active packaging application. *Int J Biol Macromol* 246. <https://doi.org/10.1016/j.ijbiomac.2023.125600>
- Tamina, S.K., Priyadarshi, R., Khan, A., Manzoor, A., Rahman, R.S.H.A., Banat, F., 2025. Recent developments in alginate-based nanocomposite coatings and films for biodegradable food packaging applications. *Int J Biol Macromol*. <https://doi.org/10.1016/j.ijbiomac.2025.139480>
- Tasrin, A., Heryanto, H., Tahir, D., 2024. Tofu dregs protein-based bioplastics for high degradability in soil and seawater: Structural properties and chemical bonding in supporting degradability. *Int J Biol Macromol* 282. <https://doi.org/10.1016/j.ijbiomac.2024.136919>
- Thorat, Y. V., Chavan, S.S., Mohite, D.D., Pawar, U.S., 2024. Development of eco-friendly bio-composites using banana fibers for enhanced tensile and flexural properties. *Mater Today Proc*. <https://doi.org/10.1016/j.matpr.2024.04.061>
- Tien, N.N.T., Nguyen, H.T., Le, N.L., Khoi, T.T., Richel, A., 2023. Biodegradable films from dragon fruit (*Hylocereus polyrhizus*) peel pectin and potato starches with glutaraldehyde. *Food Packag Shelf Life* 37. <https://doi.org/10.1016/j.fpsl.2023.101084>
- L., Pal, L., 2023. Harnessing total chemical-free paper and materials barrier properties by mechanical modification of cellulosic security and environmental sustainability. *Appl Mater Today* 35. <https://doi.org/10.1016/j.apmt.2023.101973>



- Vázquez-Morillas, A., Alvarez-Zeferino, J.C., Cruz-Salas, A.A., Martínez-Salvador, C., Tapia-Fuentes, J., Hermoso-López Araiza, J.P., Beltrán-Villavicencio, M., Espinosa-Valdemar, R.M., Rosillo-Pantoja, I., Velasco-Pérez, M., 2024. Inventories of plastic pollution sources, flows and hotspots as a baseline for national action plans: The experience of Mexico. *Science of the Total Environment* 957. <https://doi.org/10.1016/j.scitotenv.2024.177338>
- Verma, P., Rani, R., Das, D., Rai, K.K., Gogoi, P., Badwaik, L.S., 2024. Transformation of banana peel into biodegradable film added with starch and carboxymethyl cellulose and its characterization. *Sustain Chem Pharm* 37. <https://doi.org/10.1016/j.scp.2023.101356>
- Wang, N., Wang, B., Wan, Y., Gao, B., Rajput, V.D., 2023. Alginate-based composites as novel soil conditioners for sustainable applications in agriculture: A critical review. *J Environ Manage.* <https://doi.org/10.1016/j.jenvman.2023.119133>
- Wu, H., Cui, H., Fu, C., Li, R., Qi, F., Liu, Z., Yang, G., Xiao, K., Qiao, M., 2024. Unveiling the crucial role of soil microorganisms in carbon cycling: A review. *Science of the Total Environment.* <https://doi.org/10.1016/j.scitotenv.2023.168627>
- Yang, Z., Li, M., Zhai, X., Zhao, L., Tahir, H.E., Shi, J., Zou, X., Huang, X., Li, Z., Xiao, J., 2022. Development and characterization of sodium alginate/tea tree essential oil nanoemulsion active film containing TiO<sub>2</sub> nanoparticles for banana packaging. *Int J Biol Macromol* 213, 145–154. <https://doi.org/10.1016/j.ijbiomac.2022.05.164>
- Yaqoob, N., Zahira, A., Kamal, S., Almas, M., Rehman, S., 2023. Development of multifunctional bioactive food packaging based on silver nanoparticles/grape fruit peel extract reinforced PVA composites. *Mater Today Commun* 37. <https://doi.org/10.1016/j.mtcomm.2023.107529>
- Yong, T.K., Musa, M.N.S., Abdulla, R., Derman, E., Gansau, J.A., Rajin, M., 2024. Synthesis and characterization of bioplastics, Polyhydroxyalkanoates produced bagasse by using *Bacillus cereus*. *Biocatal Agric Biotechnol* 58. [0.1016/j.bcab.2024.103181](https://doi.org/10.1016/j.bcab.2024.103181)
- V., Ruan, P., Zhou, Y., Yao, B., Wang, Y., Wang, Z., 2024. I characterization of truxillic alginate bioplastic with decent tioxidant and degradability properties in food packaging. *Mater* 41. <https://doi.org/10.1016/j.mtcomm.2024.111022>



Zhang, W., Li, X., Jiang, W., 2020. Development of antioxidant chitosan film with banana peels extract and its application as coating in maintaining the storage quality of apple. *Int J Biol Macromol* 154, 1205–1214. <https://doi.org/10.1016/j.ijbiomac.2019.10.275>

