

REFERENCES

- [1] J. Tan, S. K. Tiwari, and S. Ramakrishna, "Single-Use Plastics in the Food Services Industry: Can It Be Sustainable?," *Mater. Circ. Econ.*, vol. 3, no. 1, Dec. 2021, doi: 10.1007/s42824-021-00019-1.
- [2] M. M. Sari *et al.*, "Plastic pollution in the surface water in Jakarta, Indonesia," *Mar. Pollut. Bull.*, vol. 182, Sep. 2022, doi: 10.1016/j.marpolbul.2022.114023.
- [3] Inamuddin and T. Altalhi, Eds., *Handbook of Bioplastics and Biocomposites Engineering Applications*, 2nd ed. Scrivener Publishing, 2023.
- [4] A. Krishnamurthy and P. Amritkumar, "Synthesis and characterization of eco-friendly bioplastic from low-cost plant resources," *SN Appl. Sci.*, vol. 1, no. 11, Nov. 2019, doi: 10.1007/s42452-019-1460-x.
- [5] M. Sohany, I. S. M. A. Tawakkal, S. H. Ariffin, N. N. A. K. Shah, and Y. A. Yusof, "Characterization of anthocyanin associated purple sweet potato starch and peel-based ph indicator films," *Foods*, vol. 10, no. 9, 2021, doi: 10.3390/foods10092005.
- [6] A. Jiménez, M. J. Fabra, P. Talens, and A. Chiralt, "Edible and Biodegradable Starch Films: A Review," *Food and Bioprocess Technology*, vol. 5, no. 6. pp. 2058–2076, Aug. 2012. doi: 10.1007/s11947-012-0835-4.
- [7] L. Li, W. Zha, X. Huang, Y. Gong, and S. Li, "Fabrication and Application of Tannin Double Quaternary Ammonium Salt/Polyvinyl Alcohol as Efficient Sterilization and Preservation Material for Food Packaging," *Molecules*, vol. 29, no. 17, p. 4264, Sep. 2024, doi: 10.3390/molecules29174264.
- [8] Failisnur and G. Yeni, "Stabilization of Gambier Process Wastewater and Its Application as Silk Dye," *BIOPROPAL Ind.*, vol. 4, no. 1, pp. 7–16, 2013.
- [9] A. Ardinal and S. Sy, "The Effect of alum and tunjung concentration in

- gambier processing wastewater for leather tanning,” *J. Litbang Ind.*, pp. 97–104, 2019.
- [10] R. O. Ebewe, *Polymer science and technology*. 2000. doi: 10.1016/0261-3069(95)90127-2.
- [11] W. D. Callister and D. G. Rethwisch, *Materials Science and Engineering: An Introduction*, vol. 8, no. 2. 2020.
- [12] M. Rujnić-Sokele and A. Pilipović, “Challenges and opportunities of biodegradable plastics: A mini review,” *Waste Management and Research*, vol. 35, no. 2. SAGE Publications Ltd, pp. 132–140, Feb. 01, 2017. doi: 10.1177/0734242X16683272.
- [13] L. P. de S. Vandenberghe, A. Pandey, R. Sirohi, and C. R. Soccol, *Second and Third Generation Bioplastics*. 2023. doi: 10.1201/9781003344018.
- [14] J. Moohan *et al.*, “Cellulose nanofibers and other biopolymers for biomedical applications. A review,” *Appl. Sci.*, vol. 10, no. 1, 2020, doi: 10.3390/app10010065.
- [15] D. Elieh-Ali-Komi, M. R. Hamblin, and E.-A.-K. Daniel, “Chitin and Chitosan: Production and Application of Versatile Biomedical Nanomaterials,” *Int. J. Adv. Res.*, vol. 4, no. 3, pp. 411–427, 2016, [Online]. Available: <http://www.journalijar.com>
- [16] N. A. Yanti, L. Sembiring, S. Margino, and S. W. Ahmad, *Bacterial Production of Poly-b-hydroxybutyrate (PHB): Converting Starch into Bioplastics*. 2021. doi: 10.1007/978-981-16-1823-9_9.
- [17] Vimal Katiyar., *Bio-Based Plastics for Food Packaging Applications*. Shawbury, Shrewsbury, Shropshire, SY4 4NR, United Kingdom: Smithers Pira, 2017.
- [18] M. A. Villar, S. A. Barbosa, M. A. Gracia, L. A. Castillo, and O. V. Lopez, Eds., *Starch-Based Materials in Food Packaging*. Academic Press, 2017.
- [19] S. Pérez and E. Bertoft, “The molecular structures of starch components and

- their contribution to the architecture of starch granules: A comprehensive review,” *Starch/Staerke*, vol. 62, no. 8. pp. 389–420, Aug. 2010. doi: 10.1002/star.201000013.
- [20] C. C. Chen, C. Lin, M. H. Chen, and P. Y. Chiang, “Stability and quality of anthocyanin in purple sweet potato extracts,” *Foods*, vol. 8, no. 9, 2019, doi: 10.3390/foods8090393.
- [21] Yuliansar, Ridwan, and Hermawati, “Karakterisasi pati ubi jalar putih, orange, dan ungu,” *Saintis*, vol. 1, no. 2, pp. 1–13, 2020.
- [22] Y. Zheng *et al.*, “Characterization and prebiotic effect of the resistant starch from purple sweet potato,” *Molecules*, vol. 21, no. 7, 2016, doi: 10.3390/molecules21070932.
- [23] A. Rauf, Rahmawaty, and A. Z. Siregar, “The Condition of Uncaria Gambir Roxb. as One of Important Medicinal Plants in North Sumatra Indonesia,” *Procedia Chem.*, vol. 14, pp. 3–10, 2015, doi: 10.1016/j.proche.2015.03.002.
- [24] H. Ma, W. Qin, B. Guo, and P. Li, “Effect of plant tannin and glycerol on thermoplastic starch: Mechanical, structural, antimicrobial and biodegradable properties,” *Carbohydr. Polym.*, vol. 295, no. April, p. 119869, 2022, doi: 10.1016/j.carbpol.2022.119869.
- [25] L. Coltro and J. Borghetti, “Plastic packages for personal care products - Evaluation of light barrier properties,” *Polimeros*, vol. 17, no. 1, pp. 56–61, 2007, doi: 10.1590/S0104-14282007000100013.
- [26] P. Cazón, G. Velazquez, and M. Vázquez, “Characterization of mechanical and barrier properties of bacterial cellulose, glycerol and polyvinyl alcohol (PVOH) composite films with eco-friendly UV-protective properties,” *Food Hydrocoll.*, vol. 99, no. May 2019, p. 105323, 2020, doi: 10.1016/j.foodhyd.2019.105323.
- [27] M. Mahardika, H. Abrial, A. Kasim, S. Arief, F. Hafizulhaq, and M. Asrofi, “Properties of cellulose nanofiber/bengkoang starch bionanocomposites: Effect of fiber loading,” *Lwt*, vol. 116, no. August, 2019, doi:

10.1016/j.lwt.2019.108554.

- [28] R. Adams, M. Hunt, and J. Leachman, “Cryogenic Accelerated Fatigue Tester for additive manufactured polymer composite mechanical property measurement,” *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1240, no. 1, p. 012080, 2022, doi: 10.1088/1757-899x/1240/1/012080.
- [29] B. Geometries and S. Abrasion, “Standard test method for haze and luminous transmittance of transparent plastics,” *ASTM Int*, vol. 1, pp. 1–7, 2012.
- [30] D. Rahmadiawan *et al.*, “Synergistic effects of Uncaria gambir and zinc oxide in polyvinyl alcohol films for enhanced UV and blue light shielding, antimicrobial properties, and hydrophobicity: improving application performance in sustainable packaging and protective eyewear,” *RSC Adv.*, vol. 15, no. 4, pp. 2766–2778, 2025, doi: 10.1039/d4ra08801h.
- [31] A. Zeinedini, A. Akhavan-Safar, and L. F. M. da Silva, *The role of agglomeration in the physical properties of CNTs/polymer nanocomposites: A literature review*. 2025. doi: 10.1177/14644207251316470.
- [32] Y. Miyoshi, K. Kojiro, and Y. Furuta, “Effects of density and anatomical feature on mechanical properties of various wood species in lateral tension,” *J. Wood Sci.*, vol. 64, no. 5, pp. 509–514, 2018, doi: 10.1007/s10086-018-1730-z.
- [33] D. Rahmadiawan *et al.*, “Effect of post-heat treatment on the UV transmittance, hydrophobicity, and tensile properties of PVA/Uncaria gambir extract blend films,” *Heliyon*, vol. 10, no. 10, p. e30748, 2024, doi: 10.1016/j.heliyon.2024.e30748.
- [34] Y. Zare, “Study of nanoparticles aggregation/agglomeration in polymer particulate nanocomposites by mechanical properties,” *Compos. Part A Appl. Sci. Manuf.*, vol. 84, pp. 158–164, 2016, doi: 10.1016/j.compositesa.2016.01.020.
- [35] B. Correa Pinto *et al.*, “Arrowroot Starch/ZnO Nanoparticle Nanocomposite Films: Thermal, Morphological, and Tensile Properties,” *ACS Omega*, 2025,

doi: 10.1021/acsomega.5c00255.

- [36] O. Szlachetka, J. Witkowska-Dobrev, A. Baryła, and M. Dohojda, “Low-density polyethylene (LDPE) building films – Tensile properties and surface morphology,” *J. Build. Eng.*, vol. 44, no. June, 2021, doi: 10.1016/j.jobbe.2021.103386.
- [37] S. Kormin, F. Kormin, M. D. H. Beg, and M. B. M. Piah, “Physical and mechanical properties of LDPE incorporated with different starch sources,” *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 226, no. 1, 2017, doi: 10.1088/1757-899X/226/1/012157.

