



## References

- Adair, P., Sriprom, P., Narkrugsa, W., Phumjan, L., Manamoongmongkol, K., Permana, L., & Assawasaengrat, P. (2023). Preparation, characterization, and antimicrobial activity of xyloglucan-chitosan film from tamarind (*tamarind indica* L.) seed kernel. *Progress in Organic Coatings*, 179, 107486.
- Antinori, M.E., Ceseracciu, L., Mancini, G., Heredia-Guerrero, J.A., Athanassiou, A., 2020. Fine-tuning of physicochemical properties and growth dynamics of Mycelium-based materials. *ACS Appl. Bio Mater.* 3, 1044–1051
- Appels, F. V., van den Brandhof, J. G., Dijksterhuis, J., de Kort, G. W., & Wösten, H. A. (2020). Fungal mycelium classified in different material families based on glycerol treatment. *Communications biology*, 3(1), 334.
- Ashley, R. J. (1985). Permeability and plastics packaging. In *Polymer permeability*, (pp. 269-308). Dordrecht: Springer Netherlands.
- Babaei-Ghazvini, A., & Acharya, B. (2021). Humidity-responsive photonic films and coatings based on tuned cellulose nanocrystals/glycerol/polyethylene glycol. *Polymers*, 13(21), 3695.
- Bakratsas, G., Polydera, A., Katapodis, P., & Stamatis, H. (2021). Recent trends in submerged cultivation of mushrooms and their application as a source of nutraceuticals and food additives. *Future Foods*. 4. 100086.
- Ben. Z. Y., Samsudin, H., & Yhaya, M. F. (2022). Glycerol: Its properties, polymer synthesis, and applications in starch based films. *European Polymer Journal*. 175. 111377. <https://doi.org/https://doi.org/10.1016/j.eurpolymj.2022.111377>
- Bourtoom, T. (2008). Plasticizer effect on the properties of biodegradable blend film from rice starch-chitosan. *Songklanakarin Journal of Science & Technology*, 30.
- César, E., Canche-Escamilla, G., Montoya, L., Ramos, A., Duarte-Aranda, S., & Bandala, V. M. (2021). Characterization and Physical Properties of Mycelium Films Obtained from Wild Fungi: Natural Materials for Potential Biotechnological Applications. *Journal of Polymers and the Environment*. 29(12). 4098-4105. <https://doi.org/10.1007/s10924-021-02178-3>
- Crispín-Isidro, G., Hernández-Rodríguez, L., Ramírez-Santiago, C., Sandoval-Castilla, O., Lobato-Calleros, C., & Vernon-Carter, E. J. (2019). Influence of purification on physicochemical and emulsifying properties of tamarind (*Tamarindus indica* L.) seed gum. *Food Hydrocolloids*. 93. 402-412. <https://doi.org/https://doi.org/10.1016/j.foodhyd.2019.02.046>
- De Leon, A., Ljzg, G., de Ramos, P., & Sp. K. (2017). Enriched cultivation of *Lentinus squarrosulus* (Mont.) Singer: A newly domesticated wild edible mushroom in the Philippines. *Mycosphere*. <https://doi.org/10.5943/mycosphere/8/3/9>



- El Awad Azrak, S. M., Clarkson, C. M., Moon, R. J., Schueneman, G. T., & Youngblood, J. P. (2019). Wet-stacking lamination of multilayer mechanically fibrillated cellulose nanofibril (CNF) sheets with increased mechanical performance for use in high-strength and lightweight structural and packaging applications. *ACS Applied Polymer Materials*, 1(9), 2525-2534.
- 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*, 28(18), 6637.
- Gaballa, S. A., Naguib, Y., Mady, F. M., & Khaled, K. A. (2024). Polyethylene glycol: Properties, applications, and challenges. *Journal of advanced Biomedical and Pharmaceutical Sciences*, 7(1), 26-36.
- Gheribi, R., Puchot, L., Verge, P., Jaoued-Grayaa, N., Mezni, M., Habibi, Y., & Khwaldia, K. (2018). Development of plasticized edible films from *Opuntia ficus-indica* mucilage: A comparative study of various polyol plasticizers. *Carbohydrate polymers*, 190, 204-211.
- Gomes, R., Liteplo, R. G., Meek, M. E., & World Health Organization. (2002). *Ethylene glycol: human health aspects*. World Health Organization.
- Grzegorzczuk-Karolak, I., Tabaka, P., & Weremczuk-Jeżyna, I. (2024). Enhancing polyphenol yield in *Salvia viridis* L. shoot culture through liquid medium optimization and light spectrum manipulation. *Plant Cell, Tissue and Organ Culture (PCTOC)*, 156(3), 88.
- Guo, S. X., Fu, Z. Q., Sun, Y., Wang, X. Y., & Wu, M. (2022). Effect of plasticizers on the properties of potato flour films. *Starch-Stärke*, 74(1-2), 2100179.
- Gupta, I., Cherwoo, L., Bhatia, R., & Setia, H. (2022). Biopolymers: Implications and application in the food industry. *Biocatalysis and Agricultural Biotechnology*, 46, Article 102534. <https://doi.org/10.1016/j.bcab.2022.102534>
- Güler, P., Kutluer, F., & Kunduz, İ. (2011). Screening to mycelium specifications of *Ganoderma lucidum* Fr. Karst Reishi. *Hacettepe Journal of Biology and Chemistry*, 39(4), 397-401.
- Haneef, M., Ceseracciu, L., Canale, C., Bayer, I. S., Heredia-Guerrero, J. A., & Athanassiou, A. (2017). Advanced materials from fungal mycelium: fabrication and tuning of physical properties. *Scientific reports*, 7(1), 41292.
- Honary, S., & Orafai, H. (2002). The effect of different plasticizer molecular weights and concentrations on mechanical and thermomechanical properties of free films. *Drug development and industrial pharmacy*, 28(6), 711-715.
- Huntrakul, K., & Harnkarnsujarit, N. (2020). Effects of plasticizers on water sorption and aging stability of whey protein/carboxy methyl cellulose films. *Journal of Food Engineering*, 272, 109809.
- Jean, B., Heux, L., Dubreuil, F., Chambat, G., & Cousin, F. (2009). Non-electrostatic building of biomimetic Cellulose– Xyloglucan multilayers. *Langmuir*, 25(7), 3920-3923.



- Jiang. X., Jiang. T., Zhang. X., Dai. H., & Zhang. X. (2012). Melt processing of poly (vinyl alcohol) through adding magnesium chloride hexahydrate and ethylene glycol as a complex plasticizer. *Polymer Engineering & Science*. 52(10). 2245-2252.
- Kaur, P., Juglan, K. C., Kumar, H., & Singla, M. (2023). Volumetric and ultrasonic studies of PEG200, PEG400, and ethanol–chlorhexidine solutions at various temperatures. *Journal of Chemical & Engineering Data*, 68(5), 1123-1132.
- Lainioti, G.C., Bounos, G., Voyiatzis, G.A., Kallitsis, J.K. (2016). Enhanced water vapor transmission through porous membranes based on melt blending of polystyrene sulfonate with polyethylene copolymers and their cnt nanocomposites. *Polymers* 8:19
- Lau, B. F., & Abdullah, N. (2017). Bioprospecting of *Lentinus squarrosulus* Mont., an underutilized wild edible mushroom, as a potential source of functional ingredients: A review. *Trends in Food Science & Technology*, 61, 116-131. <https://doi.org/https://doi.org/10.1016/j.tifs.2016.11.017>
- Lim HY, Dolzhenko AV. Polyethylene glycol as a green medium for the microwave-assisted synthesis of guanamines. *ChemistrySelect*. 2023;8(29):1-8. doi:10.1002/slct.202302106
- Liu, T., Long, R., & Hui, C. Y. (2014). The energy release rate of a pressurized crack in soft elastic materials: effects of surface tension and large deformation. *Soft Matter*, 10(39), 7723-7729.
- Lohumi, S., Lee, S., Lee, W. H., Kim, M. S., Mo, C., Bae, H., & Cho, B. K. (2014). Detection of starch adulteration in onion powder by FT-NIR and FT-IR spectroscopy. *Journal of Agricultural and Food Chemistry*, 62(38), 9246-9251. <https://doi.org/10.1021/jf500574>.
- Mansingh. B. B., Binoj. J. S., Sai. N. P., Hassan. S. A., Siengchin. S., Sanjay. M. R., & Liu. Y. C. (2021). Sustainable development in utilization of *Tamarindus indica* L. and its by-products in industries: A review. *Current Research in Green and Sustainable Chemistry*. 4. 100207. <https://doi.org/https://doi.org/10.1016/j.crgsc.2021.100207>
- Mhd Omar. N. A., Abdullah. N., Kuppusamy. U. R., Abdulla. M., & Sabaratnam. V. (2021). Nutritional Composition, Antioxidant Activities, and Antiulcer Potential of *Lentinus squarrosulus* (Mont.) Mycelia Extract. Evidence-based complementary and alternative medicine : eCAM. 2011. 539356. <https://doi.org/10.1155/2011/539356>
- Moges, T. G., Kassa, H. S., & Woldemariam, H. W. (2024). Optimization and characterization of active bio-plastic film from tamarind (*Tamarindus indica* L.) seed starch enriched with red grape pomace extract. *Biomass Conversion and Biorefinery*, 1-19.
- Nagar. C. K., Dash. S. K., & Rayaguru. K. (2022). Tamarind seed: Composition, applications, and value addition: A comprehensive review. *Journal of Food*



Processing and Preservation. 46(10). Article e16872.  
<https://doi.org/10.1111/jfpp.16872>

- Narh Mensah. D.. & Mary. O. (2014). Morphological characteristics of mycelia growth of two strains of the indigenous medicinal mushroom. *Lentinus squarrosulus* Mont. (Singer). on solid media. *African journal of agricultural research*. 9. 1753-1760. <https://doi.org/10.5897/AJAR2013.8340>
- Nasreen. Z.. Kausar. T.. Nadeem. M.. & Bajwa. R. (2005). Study of different growth parameters in *Ganoderma lucidum*. *Micologia Aplicada International*. 17(1). 5-8.
- Nguyen, L. T., Le, V. V., Nguyen, B. T. T., Nguyen, H. T. T., Tran, A. D., & Ngo, N. X. (2023). Optimization of mycelial growth and cultivation of wild *Ganoderma sinense*. *BioTechnologia*, <https://doi.org/10.5114/bta.2023.125087>
- Nirmal. D.. Teraiya. S.. & Joshi. P. (2023). Liquid culture system: An efficient approach for sustainable micropropagation. *Curr. Agric. Res. J*. 11(1). 28-42.
- Ospina Álvarez. S. P.. Ramírez Cadavid. D. A.. Escobar Sierra. D. M.. Ossa Orozco. C. P.. Rojas Vahos. D. F.. Zapata Ocampo. P.. & Atehortúa. L. (2014). Comparison of extraction methods of chitin from *Ganoderma lucidum* mushroom obtained in submerged culture. *BioMed research international*. 2014(1). 169071.
- Pang, X., Ge, X., Ji, J., Liang, W., Liu, R., Chen, X., ... & Ge, J. (2019). Improving oxygen permeability and thermostability of polycarbonate via copolymerization modification with bio-phenol polysiloxane. *Polymers*, 11(8), 1302.
- Pattarasiripol, C., Jitjak, W., & Knijnenburg, J. T. (2025) . Biodegradable Sheets from Dried Mycelia of Edible Mushrooms. *Journal of Tropical Biodiversity and Biotechnology*, 10(1), jtbb14001-jtbb14001.
- Picco. C. M.. Suarez. N. E.. & Regenhardt. S. A. (2024). Exploring the impact of substrate composition and process parameters on biomaterial derived from fungus mycelium (*Pleurotus ostreatus*) and agricultural wastes. *MRS Advances*. 9(2). 33-38.
- Piqué. N.. Gómez-Guillén. M. D. C.. & Montero. M. P. (2018). Xyloglucan. a plant polymer with barrier protective properties over the mucous membranes: an overview. *International Journal of Molecular Sciences*. 19(3). 673.
- Rivero, S., Garcia, M. A., & Pinotti, A. J. J. O. F. E. (2009). Composite and bi-layer films based on gelatin and chitosan. *Journal of food engineering*, 90(4), 531-539.
- Rodrigues. D. C.. Cunha. A. P.. Silva. L. M. A.. Rodrigues. T. H. S.. Gallão. M. I.. & Azeredo. H. M. C. (2018). Emulsion films from tamarind kernel xyloglucan and sesame seed oil by different emulsification techniques. *Food Hydrocolloids*. 77. 270-276.  
<https://doi.org/https://doi.org/10.1016/j.foodhyd.2017.10.003>



- Sahari, J., Sapuan, S. M., Zainudin, E. S., & Maleque, M. A. (2012). A New Approach to Use Arenga Pinnata as Sustainable Biopolymer: Effects of Plasticizers on Physical Properties. *Procedia Chemistry*, 4, 254-259. <https://doi.org/https://doi.org/10.1016/j.proche.2012.06.035>
- Santhosh. R.. & Sarkar. P. . (2022). Jackfruit seed starch/tamarind kernel xyloglucan/zinc oxide nanoparticles-based composite films: Preparation. characterization. and application on tomato (*Solanum lycopersicum*) fruits. . *Food Hydrocolloids*. 133. 107917.
- Sanyang, M. L., Sapuan, S. M., Jawaid, M., Ishak, M. R., & Sahari, J. (2015). Effect of plasticizer type and concentration on tensile, thermal and barrier properties of biodegradable films based on sugar palm (*Arenga pinnata*) starch. *Polymers*, 7(6), 1106-1124.
- Servesh, A., Lokesh Kumar, S., Govindaraju, S., Tabassum, S., Raj Prasad, J., Kumar, N., & Ramaraj, S. G. (2024). Recent advances in polyethylene glycol as a dual-functional agent in heterocycle synthesis: Solvent and catalyst. *Polymers for Advanced Technologies*, 35(6), e6433.
- Shao. G.. Xu. D.. Xu. Z.. Jin. Y.. Wu. F.. Yang. N.. & Xu. X. (2024). Green and sustainable biomaterials: Edible bioplastic films from mushroom mycelium. *Food Hydrocolloids*. 146. 109289.
- Sharma. N.. Ganjoo. A.. Gairola. S.. Srivastava. A.. Singh. D.. & Babu. V. (2023). Two commercially important culinary mushrooms; *Pleurotus* spp. and *Lentinus* spp. and their cultivation potential on lignocellulosic waste from aromatic plants. *Vegetos*. 36(1). 52-61.
- Sothornvit, R., & Krochta, J. M. (2000). Plasticizer effect on oxygen permeability of  $\beta$ -lactoglobulin films. *Journal of Agricultural and Food Chemistry*, 48(12), 6298-6302.
- Stimpson. T. C.. Cathala. B.. Moreau. C.. Moran-Mirabal. J. M.. & Cranston. E. D. (2020). Xyloglucan structure impacts the mechanical properties of xyloglucan–cellulose nanocrystal layered films—a buckling-based study. *Biomacromolecules*. 21(9). 3898-3908.
- Subedi. K.. Basnet. B. B.. Panday. R.. Neupane. M.. & Tripathi. G. R. (2021). Optimization of growth conditions and biological activities of Nepalese *Ganoderma lucidum* strain Philippine. *Advances in Pharmacological and Pharmaceutical Sciences*. 2021(1). 4888979.
- Sun, Y., Meng, C., Zheng, Y., Xie, Y., He, W., Wang, Y., ... & Yue, L. (2018). The effects of two biocompatible plasticizers on the performance of dry bacterial cellulose membrane: a comparative study. *Cellulose*, 25, 5893-5908.
- Suyatma, N. E., Tighzert, L., Copinet, A., & Coma, V. (2005). Effects of hydrophilic plasticizers on mechanical, thermal, and surface properties of chitosan films. *Journal of Agricultural and Food Chemistry*, 53(10), 3950-3957.
- Tarique, J., Zainudin, E. S., Sapuan, S. M., Ilyas, R. A., & Khalina, A. (2022). Physical, Mechanical, and Morphological Performances of Arrowroot (*Maranta arundinacea*) Fiber Reinforced Arrowroot Starch Biopolymer Composites. *Polymers*, 14(3).



- Titow. W.V. (1990). Plasticisers. In PVC Plastics; Springer: Dordrecht. The Netherlands. 177–257.
- Tyagi, V., & Bhattacharya, B. (2019). Role of plasticizers in bioplastics. *MOJ Food Process. Technol*, 7(4), 128-130.
- Verma. N.. Jujjavarapu. S. E.. & Mahapatra. C. (2023). Green sustainable biocomposites: Substitute to plastics with innovative fungal mycelium based biomaterial. *Journal of Environmental Chemical Engineering*. 11(5). 110396
- Wongjiratthiti, A., & Yottakot, S. (2017). Utilisation of local crops as alternative media for fungal growth. *Pertanika Journal of Tropical Agricultural Science*, 40, 295 304.
- Zhang. H.. Cui. H.. Xie. F.. Song. Z.. & Ai. L. (2024). Tamarind seeds polysaccharide: Structure. properties. health benefits. modification and food applications. *Food Hydrocolloids*. 155. 110222.  
<https://doi.org/https://doi.org/10.1016/j.foodhyd.2024.110222>