DAFTAR PUSTAKA

Akachat, B., Himed, L., Salah, M., D'Elia, M., Zomorroda, S., Ali, R., Rastrelli, L., & Barkat, M. (2025). Optimization of pectin extraction from lemon peels using hydrochloric acid and response surface methodology. *Applied Food Research*, *5*(1). https://doi.org/10.1016/j.afres.2025.100948

Amaro Bittencourt, G., Porto de Souza Vandenberghe, L., Valladares-Diestra, K., Wedderhoff Herrmann, L., Fátima Murawski de Mello, A., Sarmiento Vásquez, Z., Grace Karp, S., & Ricardo Soccol, C. (2021). Soybean hulls as carbohydrate feedstock for medium to high-value biomolecule production in biorefineries: A review. *Bioresource Technology*, *339*, 125594. https://doi.org/10.1016/J.BIORTECH.2021.125594

Belkheiri, A., Forouhar, A., Ursu, A. V., Dubessay, P., Pierre, G., Delattre, C., Djelveh, G., Abdelkafi, S., Hamdami, N., & Michaud, P. (2021). applied sciences Extraction , Characterization , and Applications of Pectins from. *Applied Sciences Journal*, *11*(14), 1–25.

Ben Dlala, S., Mzoughi, Z., Dammak, M. I., Khwaldia, K., Le Cerf, D., Ben Halima, H., Jaffrezic-Renault, N., Korri-Youssoufi, H., & Majdoub, H. (2025). Eco-friendly films from lemon peel pectin including essential oils for the sustainable tomato preservation. *Process Biochemistry*, *157*, 56–64. https://doi.org/10.1016/J.PROCBIO.2025.06.018

Benmebarek, I. E., González-Serrano, D. J., Bechtner, J. D., Galindo, J. M., Martínez, M. M., Sánchez-Verdú, M. P., Khalid, W., & Moreno, A. (2025). Microwave-assisted subcritical water extraction of low methoxyl pectin from pistachio industry waste: Optimization, characterization, emulsification, and gelation mechanism.

Carbohydrate Polymers, *368*(April). https://doi.org/10.1016/j.carbpol.2025.124107

Benmebarek, I. E., Maqsood, S., Khalid, W., Navaf, M., Rasool, I. F. U., Moreno, A., & Esatbeyoglu, T. (2025). Valorization of agro-industrial waste to produce low-methoxyl pectin and its activation towards more sustainable applications and circular economy. *International Journal of Biological Macromolecules*, *320*(June). https://doi.org/10.1016/j.ijbiomac.2025.145953

Costa, J. M., Wang, W., Nakasu, P. Y. S., Hu, C., Forster-Carneiro, T., & Hallett, J. P. (2025). Impacts of microwaves on the pectin extraction from apple pomace: Technological properties in structuring of hydrogels. *Food Hydrocolloids*, *160*(October 2024). https://doi.org/10.1016/j.foodhyd.2024.110766

Devianti, V. A., & Arifiyana, D. (2021). Optimasi Lama Waktu Ekstraksi Dengan Metode MAE pada Pektin dari Kulit Pisang. *Journal of Herbal, Clinical and Pharmaceutical Science (HERCLIPS)*, *3*(01), 21. https://doi.org/10.30587/herclips.v3i01.3116

Duggal, M., Singh, D. P., Singh, S., Khubber, S., Garg, M., & Krishania, M. (2024). Microwave-assisted acid extraction of high-methoxyl kinnow (*Citrus reticulata*) peels pectin: Process, techno-functionality, characterization and life cycle assessment. *Food Chemistry: Molecular Sciences*, *9*(January), 100213. https://doi.org/10.1016/j.fochms.2024.100213

Gebremeskal, Y. H., Nadtochii, L. A., & Duangkaew, P. (2023). Comparison of different technologies using organic acid and mineral acid solvents on pectin extraction from apple pomace. *Processes and Food Production Equipment*, *16*(2), 13–19. https://doi.org/10.17586/2310-1164-2023-16-2-13-19

Hossain, M. M., Ara, R., Yasmin, F., Suchi, M., & Zzaman, W. (2024). Microwave and ultrasound assisted extraction techniques with citric acid of pectin from Pomelo *(Citrus maxima*) peel. *Measurement: Food*, *13*, 100135. https://doi.org/10.1016/J.MEAFOO.2024.100135

Ishartani, D., Mustika Sari, A., Arifani, R., & Kawiji. (2020). Partial Characterization of Watermelon Albedo Pectin Extracted Using Citric Acid Combined with Microwave Assisted Extraction. *IOP Conference Series: Earth and Environmental Science*, *518*(1). https://doi.org/10.1088/1755-1315/518/1/012060

Lestari, A. P. (2023). Karakterisasi Pektin Hasil Ekstraksi Dari Kulit Ari Kedelai (*Glycine Max. L*) Menggunakan Metode Microwave Assisted Extraction (Kajian Daya Listrik dan Waktu Ekstraksi). *UPN*, 167–186.

Mao, Y., Dewi, S. R., Harding, S. E., & Binner, E. (2024). Influence of ripening stage on the microwave-assisted pectin extraction from banana peels: A feasibility study targeting both the Homogalacturonan and Rhamnogalacturonan-I region. *Food Chemistry*, *460*(July). https://doi.org/10.1016/j.foodchem.2024.140549

Miran, M., Salami, M., Emam-Djomeh, Z., Moreno, F. J., & Montilla, A. (2023). Isolation and structural evaluation of pectin, pectin-based polymer blends, composites, IPNs and gels. *Handbook of Natural Polymers, Volume 1: Sources, Synthesis, and Characterization*, 369–398. https://doi.org/10.1016/B978-0-323-99853-6.00006-1

Nogueira, B. R., Backx, B. P., & Delazare, T. (2025). Starch, pectin and chitosan-based bioplastics with silver nanoparticles: An eco-friendly alternative for the food industry. *Sustainable Chemistry for the Environment*, *10*, 100246. https://doi.org/10.1016/J.SCENV.2025.100246

Pattarapisitporn, A., & Noma, S. (2025). Alternative Solvents for Pectin Extraction: Effects of Extraction Agents on Pectin Structural Characteristics and Functional Properties. *Foods*, *14*(15), 1–26. https://doi.org/10.3390/foods14152644

Pérez, J., Gómez, K., & Vega, L. (2022). Optimization and Preliminary Physicochemical Characterization of Pectin Extraction from Watermelon Rind (*Citrullus lanatus*) with Citric Acid. *International Journal of Food Science*, *2022*. https://doi.org/10.1155/2022/3068829

Prasetyo, A., Nadir, M., Sari, W. E., & Rahmaniar, Z. Z. (2023). Ekstraksi Pektin Kulit Kakao (*Theobroma Cacao L.)* Menggunakan Metode Microwave Assisted Extraction Dengan Asam Klorida. *Jurnal Teknik Kimia Vokasional (Jimsi)*, *3*(2), 44–54. https://doi.org/10.46964/jimsi.v3i2.546

Putri, W., Nasution, A., Tiffani, M., & Wardana, A. (2021). Optimasi Konsentrasi Pelarut Dan Waktu Ekstraksi Pektin Kulit Jeruk Manis (*Citrus Sinensis*) Dengan Metode Maserasi. *Jurnal Teknologi Pertanian*, *22*(1), 47–56. https://doi.org/10.21776/ub.jtp.2021.022.01.5

Rahmati, S., Abdullah, A., & Kang, O. L. (2019). Effects of different microwave intensity on the extraction yield and physicochemical properties of pectin from dragon fruit (*Hylocereus polyrhizus*) peels. *Bioactive Carbohydrates and Dietary Fibre*, *18*, 100186. https://doi.org/10.1016/J.BCDF.2019.100186

Reichembach, L. H., & de Oliveira Petkowicz, C. L. (2022). New findings on acid-extractable pectins from soy hull. *Carbohydrate Polymers*, *294*, 119831. https://doi.org/10.1016/J.CARBPOL.2022.119831

Roozbahani, S., Parsaeimehr, M., Jebelli Javan, A., & Hesarinejad, M. A. (2025). New application of smart packaging by using sumac

extract for detecting lactic cheese aging. *Applied Food Research*, *5*(2). https://doi.org/10.1016/j.afres.2025.101163

Şen, E., Göktürk, E., & Uğuzdoğan, E. (2024). Microwave-assisted extraction of pectin from onion and garlic waste under organic, inorganic and dual acid mixtures. *Journal of Food Measurement and Characterization*, *18*(5), 3189–3198. https://doi.org/10.1007/s11694-024-02395-z

Sharma, S., Wani, K. M., Mujahid, S. M., Jayan, L. S., & Rajan, S. S. (2025). Review on Pectin: Sources, Properties, Health Benefits and Its Applications in Food Industry. *Journal of Future Foods*, *6*(2), 205–219. https://doi.org/10.1016/j.jfutfo.2024.04.009

Sobmor, Lamnambhorn, K. banjong. (2020). Optimization Of Pressurised Intermittent Microwave Assisted Extraction Of Pectin From. *African Journal of Food, Agriculture, Nutrition, and Development*, *20*(2), 15582–15606. https://doi.org/10.18697/ajfand.90.18950

Thi, T., Truong, C., Nguyen, D., Tran, T., Le Thi, A. P., Thi, N., Phan, T., Kobayashi, T., & Dang Nguyen, K. (2025). Fruit Waste-Sourced Pectin As Natural Co-Coagulant For Organic Matter And Turbidity Treatment In Wastewater. In *CELLULOSE CHEMISTRY AND TECHNOLOGY Cellulose Chem. Technol* (Vol. 59, Number 2).

Truong, T. T. C., Tran, D. N. T., Thi, A. P. Le, Phan, N. T. T., Kobayashi, T., & Nguyen, K. D. (2025). Fruit Waste-Sourced Pectin As Natural Co-Coagulant for Organic Matter and Turbidity Treatment in Wastewater. *Cellulose Chemistry and Technology*, *59*(1–2), 71–83. https://doi.org/10.35812/CelluloseChemTechnol.2025.59.07

Tsai, S. H., Fan, C. H., Chung, C. P., Lu, S. T., & Lee, M. Y. (2024). Extraction of pectin from jelly fig shell using microwave heating extraction: Pectin physicochemical properties and antioxidant

activities. *International Journal of Food Engineering* , *20*(3), 201–215. https://doi.org/10.1515/IJFE-2023-0084/HTML

Tumangger, R. S. S., Muhammad, ZA, N., Jalaluddin, Nurlaila, R., & Ginting, Z. (2022). Pengaruh Asam (HNO3) Sebagai Pelarut pada Ektraksi Pktin dari Orka (*Abelmoschus esculentus*). *Jurnal Teknologi Kimia Unimal*, *11*(1), 1–11. https://ojs.unimal.ac.id/jtk/article/view/7252

Wang, D., Wang, B., Jin, X., Peng, Y., Zhao, J., Zhang, M., Wei, Y., Long, Z., & Chen, Q. (2024). Microwave-enzyme-assisted extraction of pectin from feijoa (*Acca sellowiana*) fruit: Extraction optimization, physicochemical and functional properties. *Lwt-Food Science and Technology*, *204*(June). https://doi.org/10.1016/j.lwt.2024.116445

Wani, K. M., & Patidar, R. (2025). Microwave-assisted extraction of pectin from lemon peel powder: Optimization and physicochemical properties. *Sustainable Chemistry for the Environment*, *9* (February). https://doi.org/10.1016/j.scenv.2025.100223

Zhang, L., Vlach, J., Black, I. M., Archer-Hartmann, S., Heiss, C., Azadi, P., & Urbanowicz, B. R. (2025). The pectin puzzle: Decoding the fine structure of rhamnogalacturonan-I (RG-I) in Arabidopsis thaliana uncovers new pectin features. *Carbohydrate Polymers*, *368*, 124161. https://doi.org/10.1016/J.CARBPOL.2025.124161

Zhang, W., Sun, J., Li, Q., Liu, C., Yue, R., Zhang, Y., Niu, F., Zhu, H., Ma, C., & Deng, S. (2025). Effects of different extraction solvents on the compositions, primary structures, and anti-inflammatory activity of pectin from sweet potato processing by-products. *Carbohydrate Polymers*, *347*, 122766. https://doi.org/10.1016/J.CARBPOL.2024.122766