

DAFTAR PUSTAKA

- Alves, M. S., Souza, V. G. L., Silva, J. A., Esteves, A., Pastrana, L.M., et. al. 2023. Characterization of Sodium Alginate-Based Films Blended with Olive Leaf and Laurel Leaf Extracts Obtained by Ultrasound-Assisted Technology. *Journal of Foods* 12(22), 1-20. doi: <https://doi.org/10.3390/foods12224076>.
- Auliyaaur, R.L., 2021. Sintesa Edible Film Berbahan Natrium Alginat dan Pati Tepung Sagu dengan Penambahan Gliserol sebagai Plastizier. Skripsi, UPN Veteran Jawa Timur, Surabaya. doi: <https://repository.upnjatim.ac.id/11551/>
- Ariani, F., Yunita, L., Dewi, N.T., Sukanty, N.M.W., dan Isasih, W.D., 2023. Ekstraksi Alginat dari Rumput Laut Cokelat (*Phaeophyceae*) dan Pemanfaatannya Sebagai Pengemulsi (Emulsifier) pada Produk Pangan. *Jurnal Pangan, Gizi, Kesehatan* 4(1), 12-19. doi: <https://doi.org/10.30812/nutriology.v4i1.2859>.
- Artanti, A.N., dan Lisnasari, R., 2018. Uji Aktivitas Antioksidan Ekstrak Ethanol Daun Family Solanum Menggunakan Metode Reduksi Radikal Bebas DPPH. *Jurnal of Pharmaceutical Science and Clinical Research* 3(2), 62-69. doi: <https://doi.org/10.20961/jpscr.v3i2.15378>.
- Asiri, S.A., Matar, A., Ismail, A.M., dan Farag, H.A.S., 2024. Sodium alginate edible films incorporating cactus pear extract: antimicrobial, chemical, and mechanical properties. *Italian Journal of Food Science* 36(4),151-168. doi: 10.15586/ijfs.v36i4.2675
- Association of Official Analytical Chemist (AOAC), 2000. *Official Methods of Analysis (17th Edn)*, Association of Official Analytical Chemist Inc Washington DC, USA.
- Bhatia, S., Harrasi, A.A., Shah, Y.A., Jawad, M., Azri, M.S.A., et. al. 2023. Physicochemical Characterization and Antioxidant Properties of Chitosan and Sodium Alginate Based Films Incorporated with Ficus Extract. *Polymers* 15(5), 1-14. doi: <https://doi.org/10.3390/polym15051215>.
- Bissoon, R., Bajnath, E., Mohammed, A., Mohammed, K., Lee, T., et. Al. 2018. Multistage extraction and purification of waste Sargassum natans to produce sodium alginate: An optimization approach. *Carbohydrate Polymers* 198, 109–118. doi: 10.1016/j.carbpol.2018.06.067.
- Belatmannia, Z., Kaidi, S., Atouani, S.E., Katif, C., Bentiss, F., et. al. 2020. Isolation and FTIR-ATR and ¹H NMR Characterization of Alginates from the Main Alginophyte Species of the Atlantic Coast of Morocco. *Journal of Molecules* 24, 1-9. doi: 10.3390/molecules25184335.
- Bui H.T., Park, J., Lee, E., Jeong, M., dan Park, B.J., 2023. Particulate Matter Accumulation and Elemental Composition of Eight Roadside Plant Species.

- Journals Urban Science 7(2), 1-10. doi: <https://doi.org/10.3390/urbansci7020051>.
- Bourbon, A.I., Pinheiro, A.C., Cerqueira, M.A., Rocha, C.M.R., Avides, M.C., et. al. 2011. Physico-chemical characterization of chitosan-based edible films incorporating bioactive compounds of different molecular weight. *Journal of Food Engineering* 106(2), 111-118. doi: <https://doi.org/10.1016/j.jfoodeng.2011.03.024>.
- Bojorges, H., Rubio, A.L., Abad, A.M., dan Fabra, M.J., 2023. Overview of alginate extraction processes: Impact on alginate molecular structure and techno-functional properties. *Trends in Food Sciences and Technology* 140(0), 1-16. doi:10.1016/j.tifs.2023.104142
- Chen, N., Gao, H.X., He, Q., Yu, Z.L., dan Zeng, W.C., 2022. Influence of structure complexity of phenolic compounds on their binding with maize starch. *Food Structure*, 33(37), 1-10. doi: 10.1016/j.foostr.2022.100286
- Chudasama, N.A., Sequeira, R.A., Moradiya, K., dan Prasad, K., 2021. Seaweed Polysaccharide Based Products and Materials: An Assessment on Their Production from a Sustainability Point of View. *Journal Molecules* 26(9), 1-19. doi: <https://doi.org/10.3390/molecules26092608>.
- Dehghani, S., Hosseini, S.V., dan Regenstein, J.M., 2018. Edible films and coatings in seafood preservation: A review. *Food Chemistry* 240, 505–513. doi: <https://doi.org/10.1016/j.foodchem.2017.07.034>.
- Dobrincic, A., Balbino, S., Zoric, Z., Pedisic, S., Kovacevic, D. B., et. al. 2020. Advanced technologies for the extraction of marine brown algal polysaccharides. *Journal of Marine Drugs* 18(3), 1-29. doi:10.3390/md18030168.
- Dou, L., Li, B., Zhang, K., Chu, X., dan Hou, H., 2018. Physical properties and antioxidant activity of gelatin-sodium alginate edible films with tea polyphenols. *International Journal Biological Macromolecule* 126, 1377-1383. doi: 10.1016/j.ijbiomac.2018.06.121.
- Ergina., Nuryanti. S., dan Pursitasari, I. D., 2014. Uji Kualitatif Senyawa Metabolit Sekunder pada Daun Palado (*Ageve Agustifolia*) yang Diekstraksi dengan Pelarut Air dan Etanol. *Jurnal Akademika Kimia* 3(3), 165-172. doi: <https://www.neliti.com/publications/224213/uji-kualitatif-senyawa-metabolit-sekunder-pada-daun-palado-agave-agustifolia-ya>.
- FCC., 1993. *Food Chemical Codex*. National Academy Press, Washington.

- Fajri, M., dan Daru, Y., 2022. Pengaruh Rasio Volume Pelarut dan Waktu Ekstraksi terhadap Perolehan Minyak Biji Kelor. *Jurnal AgriTech* 42(2), 123-130. doi: <https://doi.org/10.22146/agritech.59062>.
- Fardhyanti, D.S., dan Syara S.J., 2015. Karakteristik Edible film Berbahan Dasar Ekstrak Karagenan Dari Rumput Laut (*Eucheuma Cottonii*). *Jurnal Bahan Alam Terbarukan* 4(2), 68-73. doi: <https://doi.org/10.15294/jbat.v4i2.4127>.
- Fawzy, M. A., Gomaa, M., Hifney, A. F., dan Abdel-Gawad, K. M., 2017. Optimization of alginate alkaline extraction technology from *Sargassum latifolium* and its potential antioxidant and emulsifying properties. *Carbohydrate Polymers* 157, 1903–1912. doi: 10.1016/j.carbpol.2016.11.077.
- Fitriana, W.D., Ersam, T., Shimizu, K., dan Fatmawati, S., 2016. Antioxidant Activity of *Moringa oleifera* Extracts. *Indonesian Journal of Chemistry* 16(3), 297-301. doi: <https://doi.org/10.22146/ijc.21145>
- Frent, O.D., Vicas, L.G., Duteanu, N., Morgovan, C.M., Jurca, T., Pallag, A., Muresan M.E., Filip, S.M., Lucaciu, R.L., dan Marian, E., 2022. Sodium Alginate—Natural Microencapsulation Material of Polymeric Microparticles. *Polymers* 23(20), 1-24. doi: 10.3390/ijms232012108.
- Gaspar, M.C., dan Braga, M.E.M., 2023. Edible films and coatings based on agrifood residues: a new trend in the food packaging research. *Current Opinion in Food Science* 50(1), 1-7. doi: 10.1016/j.cofs.2023.101006.
- Genisa, M.U., Putri, E.S., Hasri, H., dan Nilasari, N., 2023. Penambahan Ekstrak Daun Kelor Sebagai Antioksidan Pada Karakteristik Edible Film Pati Talas (*Colocasia Esculenta*). *Jurnal Analytical and Environmental Chemistry* 8(1), 100-110. doi: <https://doi.org/10.23960/aec.v8i1.2023.p100-110>.
- Guder, A., 2016. Influence of Total Anthocyanins from Bitter Melon (*Momordica charantia* Linn.) as Antidiabetic and Radical Scavenging Agents. *Iranian Journal of Pharmaceutical Research* 15(1), 301-309. doi: <https://pmc.ncbi.nlm.nih.gov/articles/PMC4986123/>.
- Groh, K.J., Backhaus, T., Carney A.B., Geueke, B., Inostroza, P. A., et. al. 2019. Overview of known plastic packaging-associated chemicals and their hazards, *Science of the Total Environment* 651(2), 3253–3268. doi: <https://doi.org/10.1016/j.scitotenv.2018.10.015>
- Han, B., Chen, P., Guo, J., Yu, H., Zhong, S., et. al. 2023. A Novel Intelligent Indicator Film: Preparation, Characterization, and Application. *Jurnal Molecules* 28(8), 1-12. doi: <https://doi.org/10.3390/molecules28083384>.

- Harasi, A.A., Bhatia, S., Azri, M.S.A., Ullah, S., Najmi, A., et. al. 2022. Effect of Drying Temperature on Physical, Chemical, and Antioxidant Properties of Ginger Oil Loaded Gelatin-Sodium Alginate Edible Films. *Journals Membranes* 12(9), 1-18. doi: <https://doi.org/10.3390/membranes12090862>
- Hasan, M., Kumar, A.V., Mangaraj, S., Verma, D. K., dan Srivastav, P.P., 2022. Trends in Edible Packaging Films and its Prospective Future in Food: A Review. *Jurnal Applied Food Research* 2(1), 1-17. doi: <https://doi.org/10.1016/j.afres.2022.100118>.
- Hayati, F., Dewi, E.N., dan Suharto, S., 2020. Karakteristik dan Aktivitas Antioksidan Edible Film Alginat dengan Penambahan Serbuk *Spirulina platensis*. *Jurnal Saintek Perikanan* 16(4), 286-293. doi: <https://doi.org/10.14710/ijfst.16.4.286-293>
- Hernandez, C.G., Freile, P.Y., dan Hernandez, G.E., 2019. *Conventional and alternative technologies for the extraction of algal polysaccharides. Functional Ingredients from Algae for Foods and Nutraceuticals*. Woodhead Publishing, United Kingdom.
- Homayouni, A., Ehsani, M.R., Azizi, A., dan Yarmand, M.S., 2007. Effect of lecithin and calcium chloride solution on the Microencapsulation process yield of calcium alginate beads. *Iranian Polymer Journal* 16(9), 597-606. doi: <https://www.researchgate.net/publication/228632739>.
- Iryanti. T., Wahab, A. W., dan Bahar, R., 2018. Potential Na-Alginate extract from brown algae *Sargassum* sp. of the mango maturation process. *Indonesia Chimica Acta* 11(2), 17-27. doi: <https://doi.org/10.20956/ica.v11i2.6488>.
- Irianto, H.E., Giyatmi, G., Fransiska, D., dan Nuraelah, A., 2023. Physical and Chemical Characteristics of Alginate Extracted from *Sargassum* sp. *IOP Conference Series Earth and Enviroment* 1117, 1-11. doi: 10.1088/1755-1315/1177/1/012029.
- Iqbal, E., Salim, K.A., Lim, L.B.L., 2015. Phytochemical screening, total phenolics and antioxidant activities of bark and leaf extracts of *Goniothalamus velutinus* (Airy Shaw) from Brunei Darussalam. *Journal of King Saud University* 27, 242-232. doi: <http://dx.doi.org/10.1016/j.jksus.2015.02.003>
- Jafari, R., Zandi, M., dan Gonjloo, A., 2022. Characterization of Alginate-Gelatin Edible Film Containing Anise (*Pimpinella anisum* L.) Essential Oil. *Journal of Polymers and the Enviroment* 31(122), 1568-1583. doi: <https://doi.org/10.1007/s10924-022-02707-8>
- Jatav, J., Tarafdar, A., Saravanan, C., dan Bhattacharya, B., 2020. Assessment of Antioxidant and Antimicrobial Property of Polyphenol-Rich Chitosan-

- Pineapple Peel Film. Journal of Food Quality 7, 1-10. doi: <https://doi.org/10.1155/2022/8064114>.
- Jutaporn, C.T., Suphitchaya, C., dan Wittaya, T., Antimicrobial activity and characteristics of edible films incorporated with Phayom wood (*Shorea toluca*) extract. International Food Research Journal 18(1), 39-54. doi: [http://www.ifrj.upm.edu.my/18%20%2801%29%202011/%285%29%20IFRJ-2010-076%20Thawien%20Thailand\[1\].pdf](http://www.ifrj.upm.edu.my/18%20%2801%29%202011/%285%29%20IFRJ-2010-076%20Thawien%20Thailand[1].pdf)
- Kafelau, M., Kopom, A.M., Baunsele, A.B., Tukan, M.B., Leba, M.U., et. al. 2022. Phytochemical Screening and TLC Profiling of Combination Extracts of Avocado (*Persea americana* Mill.) and Papaya (*Carica papaya*) Leaves from Timor Island. Indonesian Journal of Chemical Research 10(1), 32-37. doi: 10.30598/ijcr.2022.10-boe
- Kamisyah, S., Sapar, A., Briliantoro, R., dan Sayekti, E., 2020. Isolasi Dan Karakterisasi Alginat dari Rumpun Laut (Sargassum Polycystum) Asal Perairan Singkawang Kalimantan Barat. Jurnal Kimia Khatulistiwa 8(3), 62-71. doi: <https://jurnal.untan.ac.id/index.php/jkkmipa/article/view/42395>
- Kasmara, D.P., Rashid, N.A., dan Perangin-angin, S.A.B., 2024. The Active Compounds In Polyscias Scutellaria Identified Based On The Solvent. Indonesian Journal of Global Health Research 6(6), 693-700. doi: <http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR>.
- Katsube, T., Tsurunaga, Y., Sugiyama, M., Furuno, T., dan Yamasaki, Y., 2009. Effect of air-drying temperature on antioxidant capacity and stability of polyphenolic compounds in mulberry (*Morus alba* L.) leaves. Food Chemistry 113, 964-969. doi: 10.1016/J.FOODCHEM.2008.08.041
- Khasanah, N.N., Amalia, V., Vierai, B.V.E., dan Sawitri, A., 2019. Na-Alginate Utilization of Brown Algae (*Sargassum* sp.) as A Halal Edible Film Basic Materials. Indonesian Journal of Halal Research 1(1), 9-13. doi: 10.15575/ijhar.4242.
- Khajouei, R.A., Tounsi, L., Shahabi, N., Patel, A.N., Abdelkafi, S., et. al. 2022. Structures, Properties and Applications of Alginates. Marine Drugs 20(6), 1-18. doi: <https://doi.org/10.3390/md20060364>.
- Kuan, Y.L., Sivasvaran, S.N., Pui, L.P., Yusof, Y.A., dan Senpan, T., 2019. Development And Characterisation Of A Pectin-Based Edible Film That Contains Mulberry Leaf Extract And Its Bio-Active Components. Food Hydrocolloids 121, 1-12. doi: <https://doi.org/10.1016/j.foodhyd.2021.107046>
- Kusumawardany, S.F., Utami, N., dan Saryanti, D., 2023. Fotoproteksi Dan Aktivitas Antioksidan Nanoenkapsulasi Ekstrak Etanol Buah Kersen (*Muntingia*

- calabura* L.). *Majalah Farmasi dan Farmakologi* 27(3), 133-139. doi: 10.20956/mff.v27i3.24892.
- Kong, I., Degraeve, P., dan Pui, L.P., 2022. Polysaccharide-Based Edible Films Incorporated with Essential Oil Nanoemulsions: Physico-Chemical, Mechanical Properties and Its Application in Food Preservation—A Review. *Foods* 11(4), 2-29. doi: <https://doi.org/10.3390/foods11040555>.
- Kong, I., Lamudji, I.G., Angkow, K.J., Insani, R.M.S., Mas, M.A., dan Pui, L.P., 2023. Application of Edible Film with Asian Plant Extracts as an Innovative Food Packaging: A Review. *Coatings*, 13(2), 1-18. doi: <https://doi.org/10.3390/coatings13020245>.
- Lestari, R.S.D., Sari, D.K., Ridho, M.K.M., dan Lusi, T., 2018. Extraction Total Phenolic Content of Ketapang Leaves (*Terminalia catappa*) using Ultrasonic. *World Chemical Engineering Journal* 2(1): 6-11. doi: <https://jurnal.untirta.ac.id/index.php/WCEJ/article/view/3387/2569>.
- Liah, J.L., Lahming., dan Rauf, R.R., 2023. The Effect of Additional Lemongrass Extract (*Cymbopogon nardus* L.) on the Characteristics of Edible Film Sodium Alginate and Arabic Gum. *Formosa Journal of Science and Technology* 2(8), 2057-2070. doi: <https://doi.org/10.55927/fjst.v2i8.5722>.
- Li, H., Liu, C., Sun, J., dan Lv, S., 2023. Bioactive Edible Sodium Alginate Films Incorporated with Tannic Acid as Antimicrobial and Antioxidative Food Packaging. *Journal of Foods* 11(19), 1-15. doi: <https://doi.org/10.3390/foods11193044>.
- Luo, Y., Liu, H., Yang, S., Zeng, J., dan Wu, Z., 2019. Sodium Alginate-Based Green Packaging Films Functionalized by Guava Leaf Extracts and Their Bioactivities. *Materials* 12(18), 1-15. doi: <https://doi.org/10.3390/ma12182923>.
- Lohvina, H., Sandor, M., dan Wink, M., 2022. Effect of Ethanol Solvents on Total Phenolic Content and Antioxidant Properties of Seed Extracts of Fenugreek (*Trigonella foenum-graecum* L.) Varieties and Determination of Phenolic Composition by HPLC-ESI-MS. *Jurnal Diversity* 14(1), 1-21. doi: <https://doi.org/10.3390/d14010007>.
- Lorbeer, A. J., Lahnstein, J., Bulone, V., Nguyen, T., dan Zhang, W., 2015. Multiple-response optimization of the acidic treatment of the brown alga *Ecklonia radiata* for the sequential extraction of fucoidan and alginate. *Bioresource Technology* 197, 302–309. doi: 10.1016/j.biortech.2015.08.103.
- Madhavan, K., Rukayadi, Y., dan Mutalib, A.A., 2023. Phytochemical Constituents and Toxicity Analysis of Ethanolic Ketapang (*Terminalia catappa* L.) Leaf

- Extract. *Malaysian Applied Biology* 52(3), 105-114. doi: <https://doi.org/10.55230/mabjournal.v52i3.2685>.
- Maharadingga., Pahriyani, A., dan Arista, D., 2021. Uji Aktivitas Ekstrak Etanol 70% Daun Ketapang (*Terminalia catappa* L.) pada Hamster Syrian Jantan Hiperglikemia dan Hiperkolesterolemia dengan Parameter Pengukuran Kolesterol Total dan LDL. *Jurnal Ilmu Kefarmasian* 2(2), 80-88. doi: <https://doi.org/10.31764/lf.v2i2.5488>.
- Maharani, A. A., Husni, A., dan Ekantari, N., 2017. Karakteristik natrium alginat rumput laut cokelat *Sargassum fluitans* dengan metode ekstraksi yang berbeda. *Jurnal Pengolahan Hasil Perikanan Indonesia* 20(3), 478-487. doi: journal.ipb.ac.id/index.php/jphpi.
- Mazumder, A., Holdt, S. L., Francisci, D. D., Morales, A. M., Mishra, H. N., dan Angelidaki, I., 2016. Extraction of alginate from *Sargassum muticum*: Process optimization and study of its functional activities. *Journal of Applied Phycology* 28(6), 3625–3634. doi: <https://doi.org/10.1007/s10811-016-0872-x>
- Mun, C.H., Nyam, K.L., Yusof, Y.A., dan Pui, L.P., 2020. Investigation of Properties of Polysaccharide-Based Edible Film Incorporated with Functional Melastoma Malabathricum Extract. *Carpathian Journal of Food Science and Technology*, 12(1), 110-119. doi: 0.34302/crpjfst/2020.12.1.12
- Mulyani, D., 2022. Uji Antioksidan Ekstrak Etanol Alga Merah (*Gracilaria* Sp.) Dengan Metode Frap (*Ferric Reducing Antioxidant Power*). Skripsi, Universitas Al-Ghifari, Bandung. doi: [http://repository.unfari.ac.id/xmLui/bitstream/handle/123456789/1550/Skripsi i.pdf?sequence=1](http://repository.unfari.ac.id/xmLui/bitstream/handle/123456789/1550/Skripsi%20i.pdf?sequence=1)
- Mohammed, A., Rivers, A., Stuckey, D.C., dan Ward, K., 2020. Alginate extraction from *Sargassum* seaweed in the Caribbean region: Optimization using response surface methodology, *Elsevier* 24,1-30. doi: 10.1016/j.carbpol.2020.116419 .
- Montero, M.P., Guillen, M.C.G., Caballero, M.E.L., dan Canovas, G.V.B., 2017. *Edible Films and Coatings Fundamentals and Applications*. CRC Press Taylor and Francis Group, USA.
- Nisa, F.C., dan Huri, D., 2014. Pengaruh Konsentrasi Gliserol dan Ekstrak Ampas Kulit Apel terhadap Karakteristik Fisik dan Kimia Edible Film. *Jurnal Pangan dan Agroindustri* 2(4), 29-40. doi: <https://jpa.ub.ac.id/index.php/jpa/article/view/75>.

- Ningrum, R.S., Sondari, D., Amanda, P., Widyaningrum, B.A., Burhani, D., et. al. 2020. Properties of Edible Film from Modified Sago Starch Precipitated by Butanol. *Jurnal Sains Materi Indonesia* 21(4), 164-169. doi: 10.17146/jsmi.2020.21.4.6022
- Nuraini, S., 2024. Optimasi Ekstraksi Dan Penetapan Kadar Tanin Daun Sambung Nyawa (*Gynura Procumbens*) Menggunakan *Response Surface Methodology*. Skripsi, Universitas Pakuan, Bogor. doi: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://eprints.unpak.ac.id/8132/1/Skripsi_Siti%20Nuraini_066119099.pdf.
- Nugrahani, R., Yayuk, A., dan Hakim, A., 2016. Skrining Fitokimia Dari Ekstrak Buah Buncis (*Phaseolus vulgaris* L) Dalam Sediaan Serbuk. *Jurnal Penelitian Pendidikan IPA* 2(1): 96–103. doi: 10.29303/jppipa.v2i1.38.
- Nugroho, B.A., dan Adhi, B., 2021. Brian Adhi Nugroho, Brian Adhi (2021) Pengaruh Penambahan Ekstrak Sirih Hijau (*Piper betle* L.) Terhadap Edible Film Antibakteri Berbasis Alginat. Skripsi, Universitas Sahid, Jakarta. doi: https://repository.usahid.ac.id/1224/.
- Nugroho, R.A., Manurung, H., Saraswati, D., Ladyescha, D., dan Nur, F.M., 2016. The Effects of *Terminalia catappa* L. Leaves Extract on the Water Quality Properties, Survival and Blood Profile of Ornamental fish (*Betta* sp) Cultured. *Journal Biosaintifika* 8(2), 240-247. doi: https://doi.org/10.15294/biosaintifika.v8i2.6519.
- Noguiera, M.T., Chica, L.R., Yamashita, C., Nunes, N.S.S., Moraes, I.C.F., et. al. 2022. Optimal conditions for alkaline treatment of alginate extraction from the brown seaweed *Sargassum cymosum* C. Agardh by response surface methodology. *Applied Food Research* 2, 1-8. doi: https://doi.org/10.1016/j.afres.2022.100141
- Nowak, N., Grzebieniarz, W., Cholewa-Wójcik, A., Juszczak, L., Konieczna-Molenda, A., et. al. 2024. Effects of Selected Plant Extracts on the Quality and Functional Properties of Gelatin and Furcellaran-Based Double-Layer Films. *Food Bioprocess Technol* 17(5), 1201–1214. doi: https://doi.org/10.1007/s11947-023-03190-2.
- Oyeniran, O.H., Ademiluyi, A.O., dan Oboh, G., 2020. Comparative study of the phenolic profile, antioxidant properties, and inhibitory effects of Moringa (*Moringa oleifera* Lam.) and Almond (*Terminalia catappa* Linn.) leaves on acetylcholinesterase and monoamine oxidase activities in the head region of Fruitfly (*Drosophila melanogaster* Meigen) in vitro. *Journal of Food Biochemistry* 45(3), 1-10. doi: 10.1111/jfbc.13401.

- Ordonez, E.G., dan Ruperez, P., 2011. FTIR-ATR spectroscopy as a tool for polysaccharide identification in edible brown and red seaweeds. *Food Hydrocolloids* 25, 1514-1520. doi: 10.1016/j.foodhyd.2011.02.009.
- Park, Y., Malgas, S., Krause, R.W.M., dan Pletschke, B.I., 2024. Extraction and characterisation of sodium alginate from the Southern African seaweed *Ecklonia maxima*. *Botanica Marina* 67(5), 513-523. doi: <https://doi.org/10.1515/bot-2024-0011>.
- Pasanda, O.S.R., Indriati, S., Amri., Ma'ruf, A.A., dan Hayah, M.T.S.A., 2022. Uji Aktivitas Antioksidan Dan Kadar Polifenol Daun Ketapang (*Terminalia Catappa* L.). *Prosiding*, 7, 64-74. doi: <https://jurnal.poliupg.ac.id/index.php/snp2m/article/view/3891>
- Paul, P.T., Joy, J.M., Salim, F.T., Pradeep, A., Chatterjee, N.S., dan Matheew, S., 2023. Evaluation Of The Proximate Composition, Minerals, And Heavy Metals Of Brown Seaweeds: *Sargassum Wightii* And *Sargassum Thunbergii* Collected From The Mandapam Coastal Regions, Tamil Nadu. *International Journal of Zoology and Applied Biosciences* 8(6), 106-112. doi: <https://doi.org/10.55126/ijzab.2023.v08.i06.016>
- Pawar, S.N., 2017. *Seaweed Polysaccharides Isolation, Biological and Biomedical Application, Chapter 8*. Elsevier Inc. Amsterdam.
- Pereira, L., dan Cotas, J., 2020. *Alginates- A General Overview*. IntechOpen, United Kingdom.
- Pratiwi, L., Fudholi, A., Martien, R., dan Pramono, S., 2016. Ekstrak etanol, Ekstrak etil asetat, Fraksi etil asetat, dan Fraksi n-heksan Kulit Manggis (*Garcinia mangostana* L.) Sebagai Sumber Zat Bioaktif Penangkal Radikal Bebas. *Journal of Pharmaceutical Science* 1(2), 71-82. doi: 10.20961/jpscr.v1i2.1936.
- Putri, R. D. A., Setiawan, A., dan Anggraini, P. D., 2018. Physical properties of edible sorgum starch Film added with carboxymethyl cellulose. *Journal Physics Science* 29(2), 185–194. doi: <https://doi.org/10.21315/jps2018.29.s2.14>.
- Purwaningsih, P.P., Darmayasa, I.B.G., dan Astiti, N.P.A., 2020. Elusidasi Awal Daya Hambat Ekstrak Etanol Daun Ketapang (*Terminalia Catappa* L.) Terhadap Pertumbuhan *Staphylococcus Aureus* ATCC25923 Penyebab Gingivitis. *Jurnal Metamorfosa* 7(1), 57-64. doi: 10.24843/metamorfosa.2020.v07.i01.p08.
- Popa, A.M.D., Boscornea, A.C., Brezoiu, A.M., Tomas, S.T., Pârvulescu, O.C., dan Stan, R., 2023. Effects of Extraction Process Factors on the Composition and Antioxidant Activity of Blackthorn (*Prunus spinosa* L.) Fruit Extracts.

- Antioxidants Journal 12(10), 1-19. doi: <https://doi.org/10.3390/antiox12101897>.
- Rambabu, K., Bharath, G., Banat, F., Show, P. L., Heriberto dan Cocolletzi, H., 2018. Mango leaf extract incorporated chitosan antioxidant film for active food packaging. *International Journal of Biological Macromolecules* 126, 1234-1243. doi: 10.1016/j.ijbiomac.2018.12.196.
- Ramadhani, P.D., Supriyadi., Henrasty, H.K., Laksana, E.M.B., dan Santoso, U., 2023. Karakteristik Edible Film Aktif Berbasis Kitosan dengan Penambahan Ekstrak Daun Jati. *Jurnal Teknologi dan Industri Pangan* 34(1), 1-12. doi: <https://doi.org/10.6066/jtip.2023.34.1.1>
- Rahmawati, I., Fachri, B.A., Nurtsulutsiyah., Manurung, Y.H., Reza, M., et. al. 2022. Penerapan Response Surface Methodology dalam Optimasi Kondisi Proses Ekstraksi Antosianin pada Limbah Kulit Kakao dengan Metode Maserasi Menggunakan Pelarut Etanol. *Jurnal Kimia dan Terapannya* 6(1), 24-31. doi:10.17977/um0260v6i12022p024.
- Rawdkuen, S., 2019. *Edible films Incorporated with Active Compounds: Their Properties and Application. Active Antimicrobial Food Packaging*, IntechOpen. Turki.
- Rusli A., Metusalach, Salangke dan Tahir, M., 2017. Karakteristik Edible Film Karagenan dengan PemLastis Gliserol. *JPHPI* 20(2): 219-229. doi: <https://doi.org/10.17844/jphpi.v20i2.17499>.
- Rusman, N.H., 2019. Potensi Limbah Kulit Buah Sebagai Bahan Baku Dalam Pembuatan Edible Film. *Jurnal Penelitian dan Pengembangan Agrokompleks* 2(1), 92-98. doi: <https://journal.unhas.ac.id/index.php/jppa/article/view/6537>.
- Rodrigues, P.R., dan Druzian, J.I., 2018. Impact of Diferent Bacterial Strains on The Production, Composition, And Properties of Novel Polyhydroxyalkanoates Using Crude Palm Oil as Substrate. *Chemical and Biochemical Engineering Quarterly* 32(1), 141–150. doi: <https://doi.org/10.15255/CABEQ.2017.1207>
- Rosida, D.F., Hapsari, N., dan Dewati, R., 2021. *Edible Coating dan Film dari Biopolimer Bahan Alami Terbaru*. Mitra Abisatya, Surabaya
- Salimi, Y.K., Kamarudin, J., Ischak, N.I., dan Bialangi, N., 2022. Aktivitas Antioksidan Senyawa Metabolit Sekunder Ekstrak Metanol Daun Ketapang (*Terminalia catappa* L.). *Jambura Journal of Chemistry* 4(2):12-21. doi: <https://doi.org/10.34312/jambchem.v4i2.11618>.

- Samosir, M.V., Yusasrini, N.L.A., dan Permana, I.D.G.M., 2024. Pengaruh Suhu dan Waktu Pengeringan Terhadap Karakteristik Teh Herbal Daun Matoa (*Pometia pinnata* J.R. Forst. & G. Forst. Itepa: Jurnal Ilmu dan Teknologi Pangan 13 (1),28-46. doi: <https://doi.org/10.24843/itepa.2024.v13.i01.p03>.
- Sariningsih, N., Putra, Y.P., Pamungkas, W.P., dan Kusumaningsih, T., 2018. Edible Film from Polyblend of Ginger Starch, Chitosan, and Sorbitol as Plasticizer. IOP Conference Series: Materials Science and Engineering 333(1), 1-8. doi: <https://doi.org/10.1088/1757-899X/333/1/012083>.
- Sari, D.K., Lestari, R.S.D., Ridho, M.K.M., dan Lusi, T., 2018. Extraction Total Phenolic Content of Ketapang Leaves (*Terminalia catappa*) using Ultrasonic. World Chemical Engineering Journal 2(1): 6-11. doi: <https://www.scribd.com/document/608690516/Extraction-Total-Phenolic-Content-of-Ketapang-Leaves-Terminalia-catappa-using-Ultrasonic>
- Singh, V., Shrivastava, A., dan Wahi, N., 2015. Biosynthesis of silver nanoparticles by plants crude extracts and their characterization using UV, XRD, TEM and EDX. Academic Journal 14(33), 2554-2567. doi: 10.5897/AJB2015.14692.
- Silalahi, M., 2022. Ketapang (*Terminalia catappa* L.): Potential utilization as foodstuffs and traditional medicine. Open Access Research Journal of Life Sciences 3(2), 35–41. doi: 10.53022/oarjls.2022.3.2.0041.
- Siregar, A.F., Sabdono, A., dan Pringgenies, D., 2012. Potensi Antibakteri Ekstrak Rumput Laut Terhadap Bakteri Penyakit Kulit *Pseudomonas aeruginosa*, *Staphylococcus epidermidis*, dan *Micrococcus luteus*. Journal of Marine Research 1(2),152-160. doi: <https://doi.org/10.14710/jmr.v1i2.2032>.
- Suwarda, R., Irawadi, T.T., Suryadarma, P., dan Yuliasih, I., 2019. Stabilitas Edible Film Pati Sagu (Metroxylon Sagu Rottb.) Asetat Selama Penyimpanan Pada Berbagai Suhu. Jurnal Teknologi Industri Pertanian 29(3), 212-278. doi: 10.24961/j.tek.ind.pert.2019.29.3.278.
- Setiabudi, D., dan Tukiran., 2017. Uji Skrining Fitokimia Ekstrak Metanol Kulit Batang Tumbuhan Klampok Watu (*Syzygium littorale*). Unesa Journal of Chemistry, 6(3), 155-160. doi: <https://ejournal.unesa.ac.id/index.php/unesa-journal-of-chemistry/article/view/21991/20155>.
- Setiani W., Sudiarti T., dan Ramidar L., 2013. Preparasi dan Karakteristik Edible Film Dari Poliblend Pati Sukun-Kitosan. Valensi 3(2), 100-109. doi: 10.15408/jkv.v3i2.506
- Sravani, G., Linga, A. N., Kranthi, A., dan G, P., 2020. Screening and Evaluation of terminalia catappa and its Compound Application. International Journal of Review in Life Sciences 10(4),89–92. doi: 10.26452/ijrls.v10i4.1363

- Sumandiarsa, I.K., Bengen, D.G., Santoso, J., dan Januar, H.I., 2022. Spatial-Temporal Effect on Proximate, Trace Elements, Alginate, and Fucoxanthin Contents, of *Sargassum Polycystum* Brown Seaweed. *Journal of Hunan University Natural Science* 48(5), 67-79. doi: <http://jonuns.com/index.php/journal/article/view/587>
- Taminggu, E.R.N., dan Tahril., 2021. Identifikasi Senyawa Metabolit Sekunder Pada Batang dan Daun Lamun (Seagrass) di Teluk Palu. *Media Eksakta* 18(1), 6-11. doi: <https://doi.org/10.22487/me.v18i1.995>
- Tan, X., Sun, A., Cui, F., Li, Q., Wang, D., Li, X., dan Li, J., 2024. The physicochemical properties of Cassava Starch/Carboxymethyl cellulose sodium edible film incorporated of *Bacillus* and its application in salmon fillet packaging. *Food Chemistry*, 23, 1-14. doi: <https://doi.org/10.1016/j.fochx.2024.101537>.
- Tinoco, M.B., Gentile, P., Taylor, L., dan Hernandez, J.G., 2025. Alginate edible films as delivery systems for green tea polyphenols. *Food Hydrocolloids* 158, 1-10. doi: <https://doi.org/10.1016/j.foodhyd.2024.110518>.
- Utami, R., Khasanah, L.U., Yunitar, K.K., dan Manuhara, G.J., 2018. Pengaruh Oleoresin Daun Kayu Manis (*Cinnamomum Burmanii*) Dua Tahap Terhadap Karakteristik Edible Film Tapioka. *Caraka Tani: Journal of Sustainable Agriculture* 32(1), 55. doi: <https://doi.org/10.20961/carakatani.v32i1.15474>.
- Walidah, I.R., dan Takwanto, A., 2023. Pembuatan Bio Adsorben Dari Daun Ketapang Dengan Aktivator Asam Sulfat Secara Mechanochemical Untuk Menurunkan Kandungan Rhodamin B Pada Limbah Tekstil. *Jurnal Teknologi Separasi*. 8(4), 704-711. doi: <https://doi.org/10.33795/distilat.v8i4.432>
- Wibowo, A., Ridio, A., dan Sedjati, S., 2013. Pengaruh Suhu Ekstraksi Terhadap Kualitas Alginat Rumpun Laut *Turbinaria* sp. dari Pantai Krakal, Gunung Kidul-Yogyakarta. *Journal of Marine Research* 2(3), 15-24. doi: <https://doi.org/10.14710/jmr.v2i3.3127>.
- Wypch, G., 2020. *Handbook of Antioxidants*. ChemTech Publishing, Canada
- Zhang, X., Chen, J., Shao, X., Li, H., Jiang, Y., et. al. 2023. Structural and Physical Properties of Alginate Pretreated by High-Pressure Homogenization. *Polymers* 15(15), 1-16. doi: 10.3390/polym15153225.
- Zehiroglu, C., dan Sarikaya, S. B. O., 2019. The importance of antioxidants and place in today's scientific and technological studies. *Journal Food Science Technology* 56(11), 4757-4774. doi: 10.1007/s13197-019-03952-x.