

DAFTAR PUSTAKA

- Abd Aziz, N.A., Hasham, R., Sarmidi, M.R., Suhaimi, S.H. & Idris, M.K.H. 2021, 'A review on extraction techniques and therapeutic value of polar bioactives from Asian medicinal herbs: Case study on *Orthosiphon aristatus*, *Eurycoma longifolia* and *Andrographis paniculata*', *Saudi Pharmaceutical Journal*, vol. 29, no. 2, pp. 143–65.
- Abulateefeh, S.R. & Taha, M.O. 2015, 'Enhanced drug encapsulation and extended release profiles of calcium-alginate nanoparticles by using tannic acid as a bridging cross-linking agent', *Journal of Microencapsulation*, vol. 32, no. 1, pp. 96–105.
- ADA 2019, '2. Classification and diagnosis of diabetes: Standards of medical care in diabetes2019', *Diabetes Care*, vol. 42, no. January, pp. S13–28.
- Ahdyani, R., Novitasari, L., Martien, R. & Danarti, R. 2019, 'Formulation and characterization of timolol maleate-loaded nanoparticles gel by ionic gelation method using chitosan and sodium alginate', *International Journal of Applied Pharmaceutics*, vol. 11, no. 6, pp. 48–54.
- Ahn, S., Lee, H., Bonassar, L.J. & Kim, G. 2012, 'Cells (MC3T3-E1)-laden alginate scaffolds fabricated by a modified solid-freeform fabrication process supplemented with an aerosol spraying', *Biomacromolecules*, vol. 13, no. 9, pp. 2997–3003.
- Akhtar, M.T., Sarib, M.S.B.M., Ismail, I.S., Abas, F., Ismail, A., Lajis, N.H. & Shaari, K. 2016, 'Anti-diabetic activity and metabolic changes induced by *Andrographis paniculata* plant extract in obese diabetic rats', *Molecules*, vol. 21, no. 8.
- Anwer, M.K., Al-Mansoor, M.A., Jamil, S., Al-Shdefat, R., Ansari, M.N. & Shakeel, F. 2016, 'Development and evaluation of PLGA polymer based nanoparticles of quercetin', *International Journal of Biological Macromolecules*, vol. 92, pp. 213–9.
- Augustine, A.W., Narasimhan, A., Vishwanathan, M. & Karundevi, B. 2014, 'Evaluation of antidiabetic property of *Andrographis paniculata* powder in high fat and sucrose-induced type-2 diabetic adult male rat', *Asian Pacific Journal of Tropical Disease*, vol. 4, no. S1.
- Bhagyaraj, S. & Krupa, I. 2020, *Alginate-Mediated Synthesis of Hetero-Shaped Silver*, vol. 25, no. M, p. 435.
- Calzoni, E., Cesaretti, A., Polchi, A., Di Michele, A., Tancini, B. & Emiliani, C. 2019, 'Biocompatible polymer nanoparticles for drug delivery applications in cancer and neurodegenerative disorder therapies', *Journal of Functional Biomaterials*, vol. 10, no. 1, pp. 1–15.
- Choukaife, H., Doolaanea, A.A. & Alfatama, M. 2020, *Alginate nanoformulation: Influence of process and selected variables*, *Pharmaceutics*, vol. 13.

- Chuah, X.Q., Mun, W. & Teo, S. Sen 2017, 'Comparison study of anti-microbial activity between crude extract of *Kappaphycus alvarezii* and *Andrographis paniculata*', *Asian Pacific Journal of Tropical Biomedicine*, vol. 7, no. 8, pp. 729–31.
- Daemi, H. & Barikani, M. 2012, 'Synthesis and characterization of calcium alginate nanoparticles, sodium homopolymannuronate salt and its calcium nanoparticles', *Scientia Iranica*, vol. 19, no. 6, pp. 2023–8.
- Dai, Y., Chen, S.R., Chai, L., Zhao, J., Wang, Yitao & Wang, Ying 2019, 'Overview of pharmacological activities of *andrographis paniculata* and its major compound andrographolide', *Critical Reviews in Food Science and Nutrition*, vol. 59, no. 0, pp. S17–29.
- Dalal, S.R., Hussein, M.H., El-Naggar, N.E.A., Mostafa, S.I. & Shaaban-Dessuuki, S.A. 2021, 'Characterization of alginate extracted from *Sargassum latifolium* and its use in *Chlorella vulgaris* growth promotion and riboflavin drug delivery', *Scientific Reports*, vol. 11, no. 1, pp. 1–17.
- Danaei, M., Dehghankhold, M., Ataei, S., Hasanzadeh Davarani, F., Javanmard, R., Dokhani, A., Khorasani, S. & Mozafari, M.R. 2018, 'Impact of particle size and polydispersity index on the clinical applications of lipidic nanocarrier systems', *Pharmaceutics*, vol. 10, no. 2, pp. 1–17.
- Depkes RI 2020, *Farmakope Indonesia edisi IV*, Departemen Kesehatan Republik Indonesia.
- Devi, A.U. & Khanam, S. 2019, *Preparation and Characterization of Herbal Nanoformulation Containing Andrographis paniculata Extract*, vol. 10, no. 12, pp. 5380–5.
- Dian, L., Yang, Z., Li, F., Wang, Z., Pan, X., Peng, X., Huang, X., Guo, Z., Quan, G., Shi, X., Chen, B., Li, G. & Wu, C. 2013, 'Cubic phase nanoparticles for sustained release of ibuprofen: Formulation, characterization, and enhanced bioavailability study', *International Journal of Nanomedicine*, vol. 8, pp. 845–54.
- Geetha, P., Latha, M.S., Pillai, S.S., Deepa, B., Santhosh Kumar, K. & Koshy, M. 2016, 'Green synthesis and characterization of alginate nanoparticles and its role as a biosorbent for Cr(VI) ions', *Journal of Molecular Structure*, vol. 1105, no. Vi, pp. 54–60.
- Ghosh, P., Singha Roy, A., Chaudhury, S., Jana, S.K., Chaudhury, K. & Dasgupta, S. 2016, 'Preparation of albumin based nanoparticles for delivery of fisetin and evaluation of its cytotoxic activity', *International Journal of Biological Macromolecules*, vol. 86, pp. 408–17.
- Harreiter, J. & Roden, M. 2019, 'Diabetes mellitus—Definition, classification, diagnosis, screening and prevention (Update 2019)', *Wiener Klinische Wochenschrift*, vol. 131, no. Update, pp. 6–15.
- Hoang, N.H., Thanh, T. Le, Sangpueak, R., Treekoon, J., Saengchan, C., Thepbandit, W., Papatthi, N.K., Kamkaew, A. & Buensanteai, N. 2022,

- 'Chitosan Nanoparticles-Based Ionic Gelation Method: A Promising Candidate for Plant Disease Management', *Polymers*, vol. 14, no. 4, pp. 1–28.
- Jayakumar, T., Hsieh, C.Y., Lee, J.J. & Sheu, J.R. 2013, 'Experimental and clinical pharmacology of andrographis paniculata and its major bioactive phytoconstituent andrographolide', *Evidence-based Complementary and Alternative Medicine*, vol. 2013, no. Figure 1.
- Jiang, M., Sheng, F., Zhang, Z., Ma, X., Gao, T., Fu, C. & Li, P. 2021, 'Andrographis paniculata (Burm.f.) Nees and its major constituent andrographolide as potential antiviral agents', *Journal of Ethnopharmacology*, vol. 272, no. February, p. 113954.
- Kafshgar, M.H., Khorram, M., Khodadoost, M. & Khavari, S. 2011, 'Reinforcement of chitosan nanoparticles obtained by an ionic cross-linking process', *Iranian Polymer Journal (English Edition)*, vol. 20, no. 5, pp. 445–56.
- Karthik, C., Suresh, S., Sneha Mirulalini, G. & Kavitha, S. 2020, 'A FTIR approach of green synthesized silver nanoparticles by *Ocimum sanctum* and *Ocimum gratissimum* on mung bean seeds', *Inorganic and Nano-Metal Chemistry*, vol. 50, no. 8, pp. 606–12.
- Kelidari, H.R., Saeedi, M., Akbari, J., Morteza-Semnani, K., Gill, P., Valizadeh, H. & Nokhodchi, A. 2015, 'Formulation optimization and in vitro skin penetration of spironolactone loaded solid lipid nanoparticles', *Colloids and Surfaces B: Biointerfaces*, vol. 128, pp. 473–9.
- Khalid, A., Bashir, S., Sohail, M. & Amirzada, M.I. 2018, 'Characterization of doxorubicin nanoparticles prepared by ionic gelation', *Tropical Journal of Pharmaceutical Research*, vol. 17, no. 12, pp. 2329–34.
- Khalifa, N.E., Nur, A.O. & Osman, Z.A. 2017, 'Artemether Loaded Ethylcellulose Nanosuspensions: Effects of Formulation Variables, Physical Stability and Drug Release Profile', *International Journal of Pharmacy and Pharmaceutical Sciences*, vol. 9, no. 6, p. 90.
- Khalil, H.E., Alqahtani, N.K., Darrag, H.M., Ibrahim, H.M., Emeka, P.M., Badgeremeka, L.I., Matsunami, K. & Shehata, T.M. 2021, *Cytotoxicity Evaluation*.
- Kurniawan, D.W., Booiijink, R., Pater, L., Wols, I., Vrynas, A., Storm, G., Prakash, J. & Bansal, R. 2020, 'Fibroblast growth factor 2 conjugated superparamagnetic iron oxide nanoparticles (FGF2-SPIONs) ameliorate hepatic stellate cells activation in vitro and acute liver injury in vivo', *Journal of Controlled Release*, vol. 328, no. September, pp. 640–52.
- Lee, K.Y. & Mooney, D.J. 2012, 'Alginate: Properties and biomedical applications', *Progress in Polymer Science (Oxford)*, vol. 37, no. 1, pp. 106–26.
- Li, Y., Yan, H., Zhang, Z., Zhang, G., Sun, Y., Yu, P., Wang, Y. & Xu, L. 2015, 'Andrographolide derivative AL-1 improves insulin resistance through down-regulation of NF- κ B signalling pathway', *British Journal of Pharmacology*,

vol. 172, no. 12, pp. 3151–8.

- Ligita, T., Wicking, K., Francis, K., Harvey, N. & Nurjannah, I. 2019, 'How people living with diabetes in Indonesia learn about their disease: A grounded theory study', *PLoS ONE*, vol. 14, no. 2, pp. 1–19.
- López-Lorente, Á.I. & Mizaikoff, B. 2016, 'Recent advances on the characterization of nanoparticles using infrared spectroscopy', *TrAC - Trends in Analytical Chemistry*, vol. 84, pp. 97–106.
- Mohammed, M.A., Syeda, J.T.M., Wasan, K.M. & Wasan, E.K. 2017, 'An overview of chitosan nanoparticles and its application in non-parenteral drug delivery', *Pharmaceutics*, vol. 9, no. 4.
- Nugroho, A.E., Andrie, M., Warditiani, N.K., Siswanto, E., Pramono, S. & Lukitaningsih, E. 2012, 'Antidiabetic and antihyperlipidemic effect of *Andrographis paniculata* (Burm. f.) Nees and andrographolide in high-fructose-fat-fed rats', *Indian Journal of Pharmacology*, vol. 44, no. 3, pp. 377–81.
- Pacho, M.N., Pagni, E.N., Díaz Sierra, J.B., Morell, M.L., Sepúlveda, C.S., Damonte, E.B., García, C.C. & D'Accorso, N.B. 2021, 'Antiviral activity against Zika virus of a new formulation of curcumin in poly lactic-co-glycolic acid nanoparticles', *Journal of Pharmacy and Pharmacology*, vol. 73, no. 3, pp. 357–65.
- Pamies, R., Cifre, J.G.H., Espín, V.F., Collado-González, M., Baños, F.G.D. & De La Torre, J.G. 2014, 'Aggregation behaviour of gold nanoparticles in saline aqueous media', *Journal of Nanoparticle Research*, vol. 16, no. 4.
- Parveen, S., Misra, R. & Sahoo, S.K. 2012, 'Nanoparticles: A boon to drug delivery, therapeutics, diagnostics and imaging', *Nanomedicine: Nanotechnology, Biology, and Medicine*, vol. 8, no. 2, pp. 147–66.
- Patra, J.K., Das, G., Fraceto, L.F., Campos, E.V.R., Rodriguez-Torres, M.D.P., Acosta-Torres, L.S., Diaz-Torres, L.A., Grillo, R., Swamy, M.K., Sharma, S., Habtemariam, S. & Shin, H.S. 2018, 'Nano based drug delivery systems: Recent developments and future prospects 10 Technology 1007 Nanotechnology 03 Chemical Sciences 0306 Physical Chemistry (incl. Structural) 03 Chemical Sciences 0303 Macromolecular and Materials Chemistry 11 Medical and He', *Journal of Nanobiotechnology*, vol. 16, no. 1, pp. 1–33.
- Pratiwi, L., Fudholi, A., Martien, R. & Pramono, S. 2017, 'Self-nanoemulsifying drug delivery system (Snedds) for topical delivery of mangosteen peels (*Garcinia Mangostana* L.): Formulation design and in vitro studies', *Journal of Young Pharmacists*, vol. 9, no. 3, pp. 341–6.
- Punthakee, Z., Goldenberg, R. & Katz, P. 2018, 'Definition, Classification and Diagnosis of Diabetes, Prediabetes and Metabolic Syndrome', *Canadian Journal of Diabetes*, vol. 42, pp. S10–5.
- Puscaselu, R.G., Lobiuc, A., Dimian, M. & Covasa, M. 2020, 'Alginate: From food

industry to biomedical applications and management of metabolic disorders', *Polymers*, vol. 12, no. 10, pp. 1–30.

- Rafi, M., Devi, A.F., Syafitri, U.D., Heryanto, R., Suparto, I.H., Amran, M.B., Rohman, A., Prajogo, B. & Lim, L.W. 2020, 'Classification of *Andrographis paniculata* extracts by solvent extraction using HPLC fingerprint and chemometric analysis', *BMC Research Notes*, vol. 13, no. 1, pp. 1–6.
- Rajmohan, D. & Bellmer, D. 2019, 'Characterization of spirulina-alginate beads formed using ionic gelation', *International Journal of Food Science*, vol. 2019.
- Roden, M. 2016, 'Diabetes mellitus – Definition, Klassifikation und Diagnose', *Wiener Klinische Wochenschrift*, vol. 128, pp. 37–40.
- Saeb, A.T.M., Alshammari, A.S., Al-Brahim, H. & Al-Rubeaan, K.A. 2014, 'Production of silver nanoparticles with strong and stable antimicrobial activity against highly pathogenic and multidrug resistant bacteria', *Scientific World Journal*, vol. 2014.
- Saeedi, P., Petersohn, I., Salpea, P., Malanda, B., Karuranga, S., Unwin, N., Colagiuri, S., Guariguata, L., Motala, A.A., Ogurtsova, K., Shaw, J.E., Bright, D. & Williams, R. 2019, 'Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition', *Diabetes Research and Clinical Practice*, vol. 157, p. 107843.
- Salehi, B., Ata, A., Kumar, N.V.A., Sharopov, F., Ramírez-Alarcón, K., Ruiz-Ortega, A., Ayatollahi, S.A., Fokou, P.V.T., Kobarfard, F., Zakaria, Z.A., Iriti, M., Taheri, Y., Martorell, M., Sureda, A., Setzer, W.N., Durazzo, A., Lucarini, M., Santini, A., Capasso, R., Ostrander, E.A., Atta-ur-Rahman, Choudhary, M.I., Cho, W.C. & Sharifi-Rad, J. 2019, *Antidiabetic potential of medicinal plants and their active components*, *Biomolecules*, vol. 9.
- Sangeetha, S., Archit, R. & SathiaVelu, A. 2014, 'Phytochemical testing, antioxidant activity, HPTLC and FTIR analysis of antidiabetic plants *Nigella sativa*, *Eugenia jambolana*, *Andrographis paniculata* and *Gymnema sylvestre*', *Research Journal of Biotechnology*, vol. 9, no. 9, pp. 65–72.
- Saraei, F., Mohamadpour Dounighi, N., Zolfagharian, H., Moradi Bidhendi, S., Khaki, P. & Inanlou, F. 2013, 'Design and evaluate alginate nanoparticles as a protein delivery system', *Archives of Razi Institute*, vol. 68, no. 2, pp. 139–46.
- Selvamani, V. 2019, *Stability Studies on Nanomaterials Used in Drugs, Characterization and Biology of Nanomaterials for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery*, Elsevier Inc.
- Setyawati, I. 2015, 'Pembuatan Nanosuspensi Ekstrak Purwoceng (*Pimpinella pruatjan Molk*) Berbasis Polimer Alginat Secara Gelasi Ionik', Universitas Jenderal Soedirman.
- Sharma, R., Bajpai, J., Bajpai, A.K., Acharya, S., Shrivastava, R.B. & Shukla, S.K.

- 2014, 'Designing slow water-releasing alginate nanoreservoirs for sustained irrigation in scanty rainfall areas', *Carbohydrate Polymers*, vol. 102, no. 1, pp. 513–20.
- Sharma, S. & Sarangdevot, K. 2012, *Nanoemulsions For Cosmetics*, vol. 2, no. 3, pp. 408–15.
- Sivakumar, V. & Rajeshkumar, S. 2015, *Protective effect of Andrographis paniculata on hyperglycemic mediated oxidative damage in renal tissues of diabetic rats*, vol. 4, no. 6, pp. 287–94.
- Susanty, S. & Bachmid, F. 2016, 'Perbandingan Metode Ekstraksi Maserasi Dan Refluks Terhadap Kadar Fenolik Dari Ekstrak Tongkol Jagung (*Zea mays L.*)', *Jurnal Konversi*, vol. 5, no. 2, p. 87.
- Thwala, L.N. 2010, 'Quantum Dynamical Approach of Wavefunction Collapse in Measurement Process and Its Application to Quantum Zeno Effect', *Fortschritte der Physik/Progress of Physics*, vol. 43, no. 7, pp. 585–612.
- Truong, D.H., Nguyen, D.H., Ta, N.T.A., Bui, A.V., Do, T.H. & Nguyen, H.C. 2019, 'Evaluation of the use of different solvents for phytochemical constituents, antioxidants, and in vitro anti-inflammatory activities of *severinia buxifolia*', *Journal of Food Quality*, vol. 2019.
- Ursini, O., Angelini, R., Franco, S. & Cortese, B. 2021, 'Understanding the metal free alginate gelation process', *RSC Advances*, vol. 11, no. 55, pp. 34449–55.
- Verma, H., Negi, M., Mahapatra, B., Shukla, A. & Paul, J. 2019, 'Evaluation of an emerging medicinal crop Kalmegh [*Andrographis paniculata* (Burm. F.) Wall. Ex. Nees] for commercial cultivation and pharmaceutical & industrial uses: A review', ~ 835 ~ *Journal of Pharmacognosy and Phytochemistry*, vol. 8, no. 4, pp. 835–48.
- Zhang, H., Cheng, J. & Ao, Q. 2021, 'Preparation of alginate-based biomaterials and their applications in biomedicine', *Marine Drugs*, vol. 19, no. 5, pp. 1–24.