

DAFTAR PUSTAKA

- Adnan, M. 1980. Lipid properties and stability of partially defatted peanuts. University of Illinois. Disertasi.
- Agustina, S., N. N. Aidha, E. Oktarina, I. Setiawati. 2020. Proses formulasi emulsi fikosianin sebagai antioksidan dengan *virgin coconut oil* (VCO) sebagai fase minyak. JBI, 11(2) : 95-105.
- Agustina, S., N. N. Aidha, E. Oktarina. 2018. Ekstraksi antioksidan *Spirulina* sp. dengan menggunakan metode ultrasonikasi dan aplikasinya untuk krim kosmetik. Jurnal Kimia dan Kemasan, 40(2) : 105-116.
- Anindhita, M. A., N. Oktaviani. 2016. Formulasi *self-nanoemulsifying drug delivery system* (SNEDDS) ekstrak daun pepaya (*Carica papaya* L.) dengan *Virgin Coconut Oil* (VCO) sebagai minyak pembawa. Jurnal Pena Medika, 6(2) : 103-111.
- Anton, N. dan Vandamme, T.F. (2011). Nano-emulsions and micro-emulsions: clarifications of the critical differences. Pharmaceutical Research 28: 978-985.
- Aprilianti, N. 2021. "Pengaruh suhu dan lama penyimpanan terhadap kualitas mikroemulsi asam lemak *Ulva lactuca* yang ditambah antioksidan asam askorbat". Skripsi. Yogyakarta : Universitas Gadjah Mada.
- Arbi, B., W. F. Ma'ruf. Romadhon. 2016. Aktivitas senyawa bioaktif selada laut (*Ulva lactuca*) sebagai antioksidan pada minyak ikan. Saintek Perikanan, 12(1) : 12-18
- Ariviani, S., S. Anggrahini, S. Naruki, S. Raharjo. 2015. Characterization and chemical stability evaluation of β -carotene microemulsions prepared by spontaneous emulsification method using VCO and palm oil as oil phase. International Food Research Journal 22(6) : 2432-2439.
- Ariviani, S., S. Raharjo, S. Anggrahini, S. Naruki. 2015. Formulasi dan stabilitas mikroemulsi o/w dengan metode emulsifikasi spontan menggunakan VCO dan minyak sawit sebagai fase minyak : pengaruh rasio surfaktan-minyak. Agritech, 35(1) : 27-34.
- Ariyani, S. B., H. Ratihwulana, Asmawita. 2021. Kualitas produk *Virgin Coconut Oil* (VCO) menggunakan teknik mekanik skala industri rumah tangga. Jurnal Riset Industri Hasil Hutan, 13(2) : 133-142
- Arunima, S., T. Rajamohan. (2013) Effect of virgin coconut oil enriched diet on the antioxidant status and paraoxonase 1 activity in ameliorating the oxidative stress in rats - a comparative study. Food Function, 4, 1402-1409.
- Astuti, W. M., E. N. Dewi, R. A. Kurniasih. 2019. Pengaruh perbedaan jenis pelarut dan suhu pemanasan selama ekstraksi terhadap stabilitas mikrokapsul fikosianin dari *Spirulina platensis*. Jurnal Ilmu dan Teknologi Perikanan, 1(1) : 7-14.
- Avila, J., D. Magesh. Purification, characterization and antioxidant properties of C-Phycocyanin from *Spirulina platensis*. SIRJ-APBBP. 2015;2(1):1-15.
- Aziz, T., Y. Olga, A. P. Sari. 2017. Pembuatan *virgin coconut oil* (vco) dengan metode penggaraman. Jurnal Teknik Kimia, 23(2) : 129-136.

- Badan Standarisasi Nasional. 2008. Minyak Kelapa Virgin (VCO). SNI 7381:2008. Jakarta
- Bakan, J.A. 1995. Microemulsion. Di dalam Encyclopedia of Pharmaceutical Technology. Swarbrick, J., J.C. Boylan (Eds.). Marcel Dekker Inc, New York. p. 335-369.
- Barus, D. Agustina. Kandungan fikosianin, protein, dan antioksidan *Spirulina platensis* yang ditumbuhkan dalam media dan umur kultivasi berbeda. (Skripsi). Bogor: Program Studi Teknologi Hasil Perikanan Fakultas Perikanan dan Ilmu Kelautan Institut Pertanian Bogor. 2013.
- Belay, A. 2002. Spirulina (*Arthrospira*) as a nutritional and therapeutic supplement in health management. T. J. Amer. Nutr. Association 5(2): 27-48.
- Benedetti, S., F. Benvenuti, S. Pagliarini, S. Francogli, S. Scoglio, F. Canestrari. Antioxidant properties of a novel phycocyanin extract from the bluegreen alga *Aphanizomenon flosaquae*. Life Sci. 2004;75(19):2353– 62.
- Bennett, A., L. Bogorad. Complimentary chromatic adaptation in a filamentous bluegreen alga. The Journal of Cell Biology, 58, No. 2, 419 (1973).
- Bertolin, T. E., D. Farias, C. Guarienti, F.T.S. Petry, L.M. Colla, J.A.V. Costa. (2011). Antioxidant effect of phycocyanin on oxidative stress induced with monosodium glutamate in rats. Brazilian Archives of Biology and Technology 54(4) : 733-738.
- Boussiba, S. and A. Richmond. 1979. Isolation and purification of phycocyanin from the blue green alga *Spirulina platensis*. Arch. Microbiol., 120: 155-159.
- Boussiba, S., A. E. Richmond. 1980. C-phycocyanin as a storage protein in the blue green alga *Spirulina platensis*. Arch Microbiol 125 : 143-147
- Budhiyanti, S. A. 2013. “Karakterisasi dan identifikasi antioksidan dari rumput laut coklat *Sargassum* sp. sebagai antioksidan dalam mikroemulsi w/o”. Disertasi. Fakultas Pertanian. Universitas Gadjah Mada: Yogyakarta.
- Chaiklahan, R., N. Chirasuwan and B. Bunnag. 2012. Stability of phycocyanin extracted from *Spirulina* sp.: Influence of temperature, pH and preservatives. Process Biochemistry, 47:659-664.
- Chaiklahan, R., N. Chirasuwan, B. Bunnag. 2012. Stability of phycocyanin extracted from *Spirulina* sp.: influence of temperature, pH, and preservatives. Process Biochemistry, 47: 659-664.
- Cho, Y. H., S. Kim, E. K. Bae, C. K. Mok, J. Park. 2008. Formulation of a cosurfactant-free o/w microemulsion using nonionic surfactant mixtures. Journal of Food Sciences, 73(3) : 115-121.
- Choopani, A. (2016). A review on antioxidant properties of spirulina. Journal of Applied Biotechnology Reports. 3.
- Christwardana, M., M. M. A. Nur, Hadiyanto. 2013. *Spirulina platensis*: potensinya sebagai bahan pangan fungsional. Jurnal Aplikasi Teknologi Pangan, 2(1) : 1-4.
- Cohen Z. 1997. The chemicals of *Spirulina platensis* (*Arthrospira*): Physiology, Cell Biology and Biotechnology. Vonshak 175-204.

- Dai, J., Kim, S.M. Shin Il-S., J.D. Kim, H.Y. Lee, W.C. Shin, J.C. Kim. (2014). Preparation and stability of fucoxanthin-loaded microemulsions. *Journal of Industrial and Engineering Chemistry* 20: 2103-2110.
- Daud, A., Suriati, Nuzulyanti. 2019. Kajian penerapan faktor yang mempengaruhi akurasi penentuan kadar air metode thermogravimetri. *Lutjanus*, 24(2) : 11-16.
- Davies, J.T. 1957. "A quantitative kinetic theory of emulsion type, I. physical chemistry of the emulsifying agent", gas/liquid and liquid/liquid interface (Proceedings of the International Congress of Surface Activity), pp. 426–38.
- Deviarny, C., H. Lucida, Safni. 2012. Uji stabilitas kimia natrium askorbil fosfat dalam mikroemulsi dan analisisnya dengan HPLC. *Jurnal Farmasi Andalas*. 1(1): 1-6.
- Dewi, E.N., L. Purnamayati, R.A. Kurniasih. 2016. Antioxidant activities phycocyanin microcapsules maltodextrin and carrageenan as coating materials. *Jurnal Teknologi (Science and Engineering)*. 78(4-2): 45-450
- Dizaj, S.M. (2013). Preparation and study of vitamin a palmitate microemulsion drug delivery system and investigation of co-surfactant effect. *Journal Of Nanostructure in Chemistry*, 3(1)
- Doke JM. 2005. An improved and effisient method for the extraction of phycocyanin from *Spirulina* sp. *Journal of Food Engineering*. Vol. 1.Issue 5.Article 2.
- Elise, Cori, Syafrizayanti, Salim, Marniati. (2021). Pemurnian fikosianin dari *Spirulina platensis* dengan metode *Liquid Biphasic Flotation* (LBF) dan penentuan aktivitas antioksidannya. *Jurnal Riset Kimia*. 12. 10.25077/jrk.v12i2.412.
- Eriksen, N.T. 2008. Production of phycocyanin-a pigment with application in biology, biotecnology, food and medicine (abstract). *J. Appl. Microbiol. Biotechnol.* 80 (1): 1-14.
- Estrada, J.E.P., P.B. Bescos, A.M.V. Fresno. 2001. Anti oxidant activity of different fractions of *Spirulina platensis* protean extract. *Il Farmaco* 56: 497- 500.
- Fabrowska, J., B. Leska, G. Schroeder, B. Messyasz, M. Pikosz. 2015. "Biomass and extracts of algae as material for cosmetics." in *marine algae extracts: processes, products, and applications*, 681–706. Wiley-VCH Verlag GmbH & Co. KGaA.
- Fanun, M. (2012). Microemulsions as delivery systems. *Current Opinion in Colloid and Interface Science* 17:306-313.
- Fanun, M. 2009. *Microemulsions properties and applications*. CRC Press.
- Farihah, S., B. Yulianto, E. Yudiati. 2014. Penentuan kandungan pigmen fikobiliprotein ekstrak *Arthrospira platensis* dengan teknik ekstraksi berbeda dan uji toksisitas metode BSLT. *Journal of Marine Research* 3(2) : 140-146.
- Fitriani, E.W., E. Imelda, C. Kornelis, C. Avanti. 2016. Karakterisasi dan stabilitas fisik mikroemulsi tipe A/M dengan berbagai fase minyak. *Pharmaceutical Sciences and Research*, 3(1) : 31-44.
- Flanagan J., K. Kortegaard, D. N. Pinder, T. Rades, H. Singh. 2006. Solubilization of soybean oil In microemulsions using various surfactants. *Food Hydrocolloid*. 20:253–60.

- Flanagan, J., H. Singh. 2006. Microemulsions : a potential delivery system for bioactives in food. *Crit. Rev. Food Sci.*, 46 : 221-237.
- Flanagan, J., S. Harjinder. 2006. Microemulsions: a potential delivery system for bioactives in food. *Critical Reviews in Food Science and Nutrition*, 46(3), pp.221-37.
- Fletcher, P.D.I, J.S. Morris. 1995. Turbidity of oil-in-water microemulsion droplets stabilised by nonionic surfactants. *Colloids Surf A: Physicochem Eng Aspects* 98:147–54.
- Frengki. (2010). Isolasi, elusidasi struktur dan uji bioaktivitas kandungan kimia fraksi etil asetat kulit batang tanaman *Calophyllum macrophyllum* Scheff. (Tesis, Universitas Indonesia). <https://lib.ui.ac.id/detail?id=20296131&lokasi=lokal>
- Glazer, A. (1994) “Phycobiliproteins – a family of valuable, widely used fluorophores” *Journal of Applied Phycology*, 6(2) : 105-112.
- Gozali, D., D. Rusmiati, P. Utama. (2009). Formulasi dan uji stabilitas mikroemulsi ketokonazol sebagai antijamur *Candida albicans* dan *Tricophyton mentagrophytes*. *Farmaka*, 7 (2)
- Griffin, W.C. 1949. Classification of surface-active agents by “HLB” *Journal of The Society of Cosmetic Chemists*.
- Guleria, S., A. K. Tikku, A. Koul, S. Gupta, G. Singh, V. K. Razdan. 2013. Antioxidant and antimicrobial properties of the essential oil and extracts of *Zanthoxylum alatum* grown in North-Western Himalaya
- Haerani. 2010. Pemanfaatan limbah *Virgin Coconut Oil* (Blondo). Konsentrasi Gizi Program Studi Kesmas PPS Unhas, Makassar.
- Handayani, D. L., Yusriadi, R. Hardani. 2017. Formulasi mikroemulsi ekstrak terpurifikasi daun bayam merah (*Amaranthus tricolor* L.) sebagai suplemen antioksidan. *GALENKA Journal of Pharmacy*, 3(1) : 1-9
- Harborne, J.B. 1986. Metode fitokimia penuntun cara modern menganalisis tumbuhan (2nd ed.). (Terj.) Padmawinata K, Soediro I. ITB, Bandung.
- Hendrati, E., M. Yuwono. 2016. Efek perbandingan surfaktan dan kosurfaktan terhadap karakteristik dan efisiensi penjebaran ovalbumin dalam mikroemulsi. *Jurnal Farmasi Indonesia*, 8(1) : 310-319.
- Hendry, G.A.F., J.D. Houghton. 1996. Natural food colorant second edition. Oxford University Press: New York.
- Henriques, M., A. Silva, J. Rocha. 2007. “Extraction and quantification of pigments from a marine microalgae : a simple and reproducible method,” 586–93.
- Hiemenz, P.C., R. Rejogopalan. (1997). Principles of colloid and surface science. 3rd edition. Dekker, New York.
- Hisprastin, Y., R. F. Nuwarda. 2018. Perbedaan emulsi dan mikroemulsi pada minyak nabati. *Farmaka Suplemen*, 16(1) : 133-140.
- Hosikian, Aris, Su Lim, Ronald Halim, dan Michael K. Danquah. 2010. “Chlorophyll extraction from microalgae : a review on the process engineering aspects” 2010. doi:10.1155/2010/391632.

- Husnah, Nurlela. 2020. Analisa bilangan peroksida terhadap kualitas minyak goreng sebelum dan sesudah dipakai berulang. *Jurnal Redoks*, 5(1) : 65-71.
- Idson, B. *Pharmaceutical emulsions*. Dalam : *Lieberman, H.A., Rieger, M.M and Banker G.S, eds. Pharmaceutical Dosage Forms : Disperse System. Vol. 1*. New York : Marcel Dekker. 1989 : 233, 240.
- Indirasvari K. S., N., I. D. G. M. Permana, I. K. Suter. 2018. Stabilitas mikroemulsi VCO dalam air pada variasi HLB dari tiga surfaktan selama penyimpanan. *Jurnal Ilmu dan Teknologi Pangan*, 7(4) : 184-191
- Indonesia Eximbank Institute; University Network For Indonesia Export Development (UNIED) diwakili oleh Institute Pertanian Bogor. 2019. Proyeksi Ekspor Berdasarkan Industri: Komoditas Unggulan. Jakarta (ID). Indonesia Eximbank.
- Iyer U.M., S.A. Dhruv, Mani I.U. (2008): *Spirulina* and its therapeutic implications as a food product. In: Gershwini M.E., Belay A. (eds): *Spirulina in Human Nutrition and Health*. Boca Raton, CRC Press: 51–70.
- Kabede, E., G. Ahlgren. 1996. Optimum growth conditions and light utilization efficiency of *Spirulina platensis* (*Arthospira fusiformis*) from Lake Chitu, Ethiopia. *Hydrobiol.*, 332: 99-109.
- Kale, S. N., S. L. Deore “Emulsion micro emulsion and nano emulsion: a review”. *Systematic Reviews in Pharmacy*, 39-47, 2017.
- Kamariah, L., A. Azmi, A. Rosmawati, M.G.W. Ching, M.D. Azlina, A. Sivapragasam, C.P. Tan, O.M. Lai. (2008) Physico-chemical and quality characteristics of virgin coconut oil—A Malaysian survey. *Journal of Tropical Agriculture and Food Science*, 36, 239-248; (b) Marina A, Man YC, Nazimah S, Amin I. (2009) Chemical properties of virgin coconut oil. *Journal of the American Oil Chemists’ Society*, 86, 301-307.
- Ketaren, S. (1986). Pengantar teknologi minyak dan lemak pangan. UI Press. Jakarta
- Khan Z., P. Bhadouria, P.S. Bisen. (2005): Nutritional and therapeutic potential of *Spirulina*. *Current Pharmaceutical Biotechnology*, 6: 373–379.
- Khoirunnisa, Z., A. S. Wardana, R. Rauf. 2019. Angka asam dan peroksida minyak jelantah dari penggorengan lele secara berulang. *Jurnal Kesehatan*, 12(2) : 81-90
- Khor, Y.P., S.P. Koh, K. Long. (2014). A comparative study of the physicochemical properties of a virgin coconut oil emulsion and commercial food supplement emulsions. *Molecules*, 19(7), 9187-9202
- Khotimah, H., R. Agustina, M. Ardana. 2018. Pengaruh lama penyimpanan terhadap aktivitas antioksidan ekstrak daun miana (*Coleus atropurpureus* L. Benth). *Proceeding of the 8th Mulawarman Pharmaceuticals Conferences 2018*, 1-7.
- Kozlenko, R., dan R.H. Henson. 1998. *Spirulina: effects on the AIDS virus, cancer and the immune system*. *Spirulina Health Library*. [www. Spirulina.com](http://www.Spirulina.com). (1 Nopember 2000).
- Kumalasari, H. 2012. Validasi metoda pengukuran kadar air bubuk perisa menggunakan *moisture analyzer* Halogen HB43-S, sebagai alternatif metoda oven dan *karl fischer*. [Skripsi]. Bogor (ID): Institut Pertanian Bogor.

- Lawrence, M.J., G.D. Rees. (2000). Microemulsion-based media as novel drug delivery systems. *Advanced Drug Delivery Reviews*, 45, 94
- Leon, L., H. A. Lieberman, J. L. Kanig. *Teori dan praktek farmasi industri II*. Edisi III. Penerjemah Siti Suyatmi. Jakarta: UI Press. 1994; 1076-1079.
- Lestari, R. F. 2014. “Mikroemulsi asam askorbat sebagai penghambat kerusakan minyak ikan akibat fotooksidasi”. Skripsi. Yogyakarta: Universitas Gadjah Mada.
- Lewis, Harrison. (2012). Notification of the GRAS determination of medium chain triglycerides when added directly to human food. College Park
- Ma, Z. F., Y. Y. Lee. 2016. *Virgin Coconut Oil* and its cardiovascular health benefits. *Natural Product Communications*, 11(8) : 1151-1152.
- Mani, U.V, S. Desai, U. Iyer. Studies on the long-term effect of spirulina supplementation on serum lipid profile and glycated proteins in NIDDM patients. *Journal of Nutraceuticals, Functional & Medical Foods* 2000;2(3):25–32.
- Maradesa, R. P., F. Fatimah, M.S. Sangi. 2014. Kualitas *Virgin Coconut Oil* (VCO) sebagai minyak goreng yang dibuat dengan metode pengadukan dengan adanya penambahan kemangi (*Ocimum sanctum* L.). *Jurnal Mipa Unsrat Online*, 3(1) : 4-48.
- Margiati, D., D. Ramdhani, A. P. Wulandari. 2019. Comparative study of antioxidant phycocyanin extracts activity between *S. Platensis* with *S. Fusiformis* using DPPH method. *Indonesian Journal of Pharmaceutical Science and Technology*, 6(2) : 52-58.
- Marxen, K., K. Heinrich, S. Lippemeier, R. Hintze, A. Ruser, U. Hansen. Determination of DPPH radical oxidation caused by methanolic extracts of some microalgal species by linear regression analysis of spectrophotometric measurements. *Sensors*. 2007;7:2080-2095.
- Masojidek, J., M. Koblizek, and G. Torzillo. 2004. Photosynthesis in microalgae in: A. Richmond (Ed). *Handbook of Microalgal Culture: Biotechnology and Applied Phycology*. Blackwell Science Ltd., Iowa. p.20-39.
- Massoud, R., K. Khosravi-Darani, F. Nakhsaz, Varga, László (2016) *Evaluation of physicochemical, microbiological and sensory properties of croissants fortified with Arthrospira platensis (Spirulina)*. *CZECH JOURNAL OF FOOD SCIENCES*, 34 (4). pp. 350-355. ISSN 1212-1800
- Mauliasari, E. S., T. W. Agustini, U. Amalia. 2019. Stabilisasi fikosianin *Spirulina platensis* dengan perlakuan mikroenkapsulasi dan pH. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 22(3) : 526-534.
- McClements, D. J. 2007. *Food emulsions: principles, practices, and techniques*, second edition. CRC Press. p. 175–231.
- McClements, D. J. 2016. *Food emulsions: principles, practices, and techniques*, 3rd ed, CRC Press, Boca Raton
- McClements, D.J., E.A. Decker, J. Weiss. (2007). Emulsion-based delivery systems for lipophilic bioactive components. *Journal of Food Science* 72(8): R109-R124.

- McClements, D.J., Y. Li. (2010). Structured emulsionbased delivery systems: controlling the digestion and release of lipophilic food components. *Advances in Colloid and Interface Science* 159(2): 213-228.
- Molyneux P. 2004. The use of stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity. *Journal of Science Technology* 26: 211-219.
- Moussa, A. M., A. M. Emam, Y. M. Diab, M. E. Mahmoud, A.S. Mahmoud. 2011. Evaluation of antioxidant potential of 124 Egyptian Plants with emphasis on the action of punica granatum leaf extract on rats. *International Food Research Journal*, 18, 535-542.
- Murtiningrum, Z.L. Sarungallo, G.N. Cepeda, N. Olong. (2013). Stabilitas emulsi minyak buah merah (*Pandanus conoideus* L) pada berbagai nilai *Hydrophile Lyphophile Balance* (HLB) pengemulsi. *Jurnal Teknologi Industri Pertanian*, 23(1): 30-37
- Nevin, K.G, T. Rajamohan. (2006) Virgin coconut oil supplemented diet increases the antioxidant status in rats. *Food Chemistry*, 99, 260-266
- Okechukwu, P.N., S.O. Ekeuku, M. Sharma, C.P. Nee, H.K. Chan, N. Mohamed, Anisah Froemming GR. In vivo and in vitro antidiabetic and antioxidant activity of spirulina. *Phcog Mag.* 2019;15:17-29.
- Pahan, I. 2008. Panduan lengkap kelapa sawit. Jakarta: Swadaya
- Pakpayat, N., F. Nielloud, R. Fortuné, C. Tourne-Peteilh, A. Villarreal, I. Grillo, B. Bataille. 2009. Formulation of ascorbic acid microemulsions with alkyl polyglycosides. *Eur J. Pharm and Biopharm.* 72(2): 444-452
- Pangkey, H. 2009. Potensi spirulina. *Jurnal Perikanan dan Kelautan*, 5(3) : 92-97
- Patel, D.R., N.M. Patel, M.R. Patel, (2011). Microemulsions : A novel drug carrier system. *International Journal of Drug Formulation and Research*, 2(4), 41-52.
- Permana, I.D.G.M., L. Suhendra. 2015. Optimasi konsentrasi VCO dalam mikroemulsi m/a dengan tiga surfaktan sebagai pembawa senyawa bioaktif. *Media Ilmiah Teknologi Pangan (Scientific Journal of Food Technology)*. 2(2):106-114.
- Prasanna, R., A. Sood, P. Jaiswal, S. Nayak, V. Gupta, V. Chaudhary, M. Joshi, & C. Natarjan. 2010. Rediscovering cyanobacteria as valuable sources of bioactive compounds. *Appl. Biochem. Microbiol.* '46 (2): 119-134.
- Punampalam, R., K. S. Khoo, S. Nw. 2018. Evaluation of antioxidant properties of phycobiliproteins and phenolic compounds extracted from *Bangia atropurpurea*. *Malaysian Journal of Fundamental and Applied Sciences*, 14(2) : 289-297.
- Purnamayati, L., E. N. Dewi, R. A. Kurniasih. 2016. Karakteristik fisik mikrokapsul fikosanin *Spirulina* pada konsentrasi bahan penyalut yang berbeda. *Jurnal Teknologi Hasil Pertanian*, 9(1) : 1-8.
- Purwoko, M. L. Y., Syamsudin, P. Simanjutak. 2020. Standardisasi parameter spesifik dan nonspesifik ekstrak etanol daun kelor (*Moringa oleifera*) asal Kabupaten Blora. *Sainstech Farma*, 13(2) : 124-129.
- Rahmawati, S. I., S. Hidayatulloh, M. Suprayatmi. 2017. Ekstraksi fikosanin dari *Spirulina platensis* sebagai biopigmen dan antioksidan. *Jurnal Pertanian*, 8(1) : 36-45.

- Rao, J., McClements, D.J. (2011). Food-grade microemulsions, nanoemulsions and emulsions: fabrication from sucrose monopalmitate and lemon oil. *Food Hydrocolloids* 25: 1413-1423.
- Rauf, Rusdin. (2015). *Kimia Pangan*. ANDI. Yogyakarta.
- Ridlo, A., S. Sedjati, E. Supriyanti. 2015. Aktivitas anti oksidan fikosianin dari *Spirulina* Sp. menggunakan metode transfer elektron dengan DPPH (*1,1-difenil-2-pikrilhidrazil*). *Jurnal Kelautan Tropis*, 18(2) : 58-63.
- Romay, C., J. Armesto, D. Ramirez, R. Gonza'lez, N. Ledon, I. Garcia. 1998. Antioxidant and anti-inflammatory properties of C-phycocyanin from blue-green algae. *Inflammation Research*, 47 : 36-41.
- Romay, Ch., R. González, N. Ledón, D. Ramirez, V. Rimbau. 2003. C-Phycocyanin: a biliprotein with antioxidant, anti-Inflammatory and neuroprotective effects. *Current Protein and Peptide Science*, 4(3) : 207-216
- Rukmini, A., S. Raharjo, P. Hastuti, Supriyadi. 2011. Formulation and stability of water-in-virgin coconut oil micro emulsion using ternary food grade nonionic surfactants. *Int. Food Research Journal* 19(1): 259-264
- Rukmini, A., S. Raharjo, P. Hastuti, Supriyadi. 2012. Formulation and stability of water-in-virgin coconut oil microemulsion using ternary food grade nonionic surfactants. *International Food Research Journal* 19(1) : 259-264.
- S. Suryani, S. Sriani, F. Earnestly, M. Marganof, R. Rahmawati, S. Sevindrajuta, T. M. I. Mahlia, A. Fudhol. A comparative study of virgin coconut oil, coconut oil and palm oil in terms of their active ingredients. *Processes* 8(4) (2020) p. 402.
- Sadeli, A. Richard. 2016. "Uji aktivitas antioksidan dengan metode DPPH (1,1- Diphenyl-2-Picrylhydrazyl) ekstrak bromelain buah nanas."
- Saifuddin, A.E.. *Standarisasi bahan obat alam*. Yogyakarta: Graha Ilmu. 2011
- Sail, A. M., Wan Mustapha, W. A., S.M. Yusop, M. Y. Maskat, A. F. Shamsuddin. (2018). Optimisation of cinnamaldehyde-in-water nanoemulsion formulation using central composite rotatable design. *Sains Malaysiana*, 47(9), 1999–2008. <https://doi.org/10.17576/jsm-2018-4709-07>
- Sanchez, M., B.J. Caltillo, C. Rozo, I. Rodriquez. 2003. *Spirulina* (*Arthrospira*): an edible microorganism. *A rev. Universitas Scientiarum* 8(1): 1-16.
- Satyantini, W. H., Sukenda, E. Harris, N. B. P. Utomo. 2014. Pemberian fikosianin *Spirulina* meningkatkan jumlah sel darah, aktivitas fagositosis, dan pertumbuhan ikan kerapu bebek juvenil. *Jurnal Veteriner*, 15(1) : 46-56.
- Sedjati, S., E. Yudiati, Suryono. 2012. Profil pigmen polar dan non polar mikroalga laut *Spirulina* sp. dan potensinya sebagai pewarna alami. *Ilmu Kelautan*, 17(3) : 176-181.
- Seneviratne, K.N, C.D. Hapuarachchi, S. Ekanayake. (2009) Comparison of the phenolic-dependent antioxidant properties of coconut oil extracted under cold and hot conditions. *Food Chemistry*, 114, 1444-1449.
- Setiaji, B., S. Prayugo, 2006, *Membuat VCO berkualitas tinggi*. Penerbit Swadaya, Jakarta.

- Setyopratiwi, A., H. T. U. Hanifah. 2022. Formulasi dan stabilitas mikroemulsi minyak dalam air dengan *Virgin Coconut Oil* (VCO) sebagai fase minyak menggunakan metode emulsifikasi. Prosiding Seminar Nasional Kimia (SNK) 2022, 108-123.
- Shabrina, A., A. R. Pratiwi, M. Murrukmiyadi. 2020. Stabilitas fisik dan antioksidan mikroemulsi minyak nilam dengan variasi tween 80 dan PEG 400. *Media Farmasi*, 16(2) : 185-192.
- Shantha, N. C., E.A. Decker. (1994). Rapid, sensitive, iron-based spectrophotometric methods for determination of peroxide values of food lipids. *Journal of AOAC INTERNATIONAL*, 77(2), 421–424. <https://doi.org/10.1093/jaoac/77.2.421>
- Sharma, A., S. Shukla, S. Kumar. 2022. Chapter 7 - Application of cyanobacteria in soil health and rhizospheric engineering. *Rhizosphere Engineering*, Academic Press. 113-127.
- Silveira, S.T., J.F.M. Burkert, J.A.V. Costa, C.A.V. Burkert, S.J. Kalil. 2007. Optimization of fikosianin extraction from *Spirulina platensis* using factorial design. *Bioresources Technology* 98(1):1629–1634.
- Sinaga, A. Angelina., Luliana, Sri, Fahrurroji, Andhi. 2015, Losio antioksidan buah naga merah (*Hylocereus polyrhizus Britton and Rose*), *Pharm Sci Rest*, Vol 2, No 1.
- Siqhny, Z. D., M. N. Azkia, B. Kunarto. 2020. Karakteristik nanoemulsi ekstrak buah parijoto (*Medinilla speciosa Blume*). *Jurnal Teknologi Pangan dan Hasil Pertanian*, 15(1) : 1-10
- Soetarno, S., I. Soediro. Standarisasi mutu simplisia dan ekstrak bahan obat tradisional. *Presidium Temu Ilmiah Nasional Bidang Farmasi*. 1997
- Spolaore, P., C. Joannis-Cassan, E. Duran, A. Isambert. (2006): Commercial applications of microalgae. *Journal of Bioscience and Bioengineering*, 101: 87–96.
- Stocker, R., A.N. Glazer, B.N. Ames. 1987. Antioxidant activity of albumin-bound bilirubin. *Proc. Natl. Acad. Sci.*, 84(16): 5918–5922.
- Sucitawati, P. A., L. Suhendra, G. P. G. Putra. 2021. Karakteristik mikroemulsi a-tokoferol pada perbandingan campuran tiga surfaktan nonionik dan lama pengadukan. *Jurnal Rekayasa dan Manajemen Agroindustri*, 9(1). 33-41.
- Suhendra, L. 2014. Mekanisme *singlet oxygen quenching* oleh fucoxanthin dan efektivitasnya sebagai antioksidan dalam mikroemulsi. Universitas Gadjah Mada. Disertasi.
- Suhendra, L., S. Raharjo, P. Hastuti, dan C. Hidayat. 2012. Formulasi dan stabilitas mikroemulsi o/w sebagai pembawa fucoxanthin. *Agritech*. 32(3):230-239.
- Sulastri, E., C. Oktaviani, Yusriadi. 2015. Formulasi mikroemulsi ekstrak bawang hutan dan uji aktivitas antioksidan. *Jurnal Pharmascience*, 2(2) : 1-14
- Sulistiana, S., S. T. Darijanto. 2022. Formulasi dan evaluasi mikroemulsi gel minyak chamomile serta uji aktivitas antioksidan. *Indonesian Journal of Pharmaceutical Education*, 2(1) : 52-66
- Sulistyawati, R., L. H. Nurani, S. Hidayati, A. Mursyidi, M. Mustofa. 2017. Standarisasi kualitas fraksi etil asetat daun kelor (*Moringa oleifera lamk.*) URECOL. *Proceeding 6th University Research Colloquium 2017: Seri MIPA dan Kesehatan*, 67-72.
- Suminto. 2009. Penggunaan jenis media kultur teknis terhadap produksi dan kandungan nutrisi sel *spirulina platensis*. *Jurnal Sains dan Teknologi Perikanan*, 4(2) : 53-61.

- R.K., H.G.P. Pasansi, H.M.D.R. Herath, D.B.M. Wickramaratne, S.H.T. Sudeshika, D. Niyangoda, M.H.F. Sakeena. (2014). Formulation and stability evaluation of ketoprofen loaded virgin coconut oil based creamy emulsion. *International Journal of Pharmacy and Pharmaceutical Sciences*, 6(8), 249-254
- Swarbrick, J. 2007. *Encyclopedia of pharmaceutical Technology*, Third Edition. Pinehurst, North Carolina, USA : PharmaceuTech. Inc.
- Syafitri, E., N. Adliani, S. M. Khoirunnisa, F. K. Frima. 2020. Optimasi formula mikroemulsi berbahan dasar crude palm oil (cpo) sebagai antioksidan potensial pada kulit. *Jurnal Industri Hasil Perkebunan*, 15(1) : 49-60.
- Turner, L., J.D. Houghton, S.B. Brown. (1997). Purification and identification of apophycocyanin α and β subunits from soluble protein extracts of the red alga *Cyanidium caldarium*. Light exposure is not a prerequisite for biosynthesis of the protein moiety of this photosynthetic accessory pigment. *Planta* 201, 78-83
- Villarino, B.J., L.M. Dy, M.C.C. Lizada. (2007) Descriptive sensory evaluation of virgin coconut oil and refined, bleached and deodorized coconut oil. *LWT-Food Science and Technology*, 40, 193-199; (b) Nevin KG, Rajamohan T. (2008) Influence of virgin coconut oil on blood coagulation factors, lipid levels and LDL oxidation in cholesterol fed Sprague–Dawley rats. *European e-Journal of Clinical Nutrition and Metabolism*, 3, e1-e8.
- Voight, R. (1994). *Buku Pengantar Teknologi Farmasi*. Yogyakarta, Universitas Gadjah Mada Press.
- Vysakh A, M. Ratheesh, T.P. Rajmohanan, C. Pramod, S. Premlal, Girish Kumar B, P.I. Sibi. (2014) Polyphenolics isolated from virgin coconut oil inhibits adjuvant induced arthritis in rats through antioxidant and anti-inflammatory action. *International Immunopharmacology*, 20, 124-130.
- Wahyuni, D.T., S.B. Widjanarko. 2015. Pengaruh jenis pelarut dan lama ekstraksi terhadap ekstrak karetenoid labu kuning dengan metode gelombang ultrasonik. *Jurnal Pangan dan Agroindustri.*, 3(2):390- 401.
- Wang, L., B. Pan, J. Sheng, J. Xu, Q. Hu. Antioxidant activity of *Spirulina platensis* extracts by supercritical carbon dioxide extraction. *Food Chemistry*. 2007;105: 36-41.
- Wikanta, T., H.D. Januar, M. Nursed. 2005. Uji aktivitas antioksidan, toksisitas dan sitotoksitas ekstrak alga merah *Rhodymenia palmate*. *Jurnal Penelitian Perikanan Indonesia* Vol. 11(4): 12-25.
- Winarno, F.G., 1997. *Kimia Pangan dan Gizi*. Gramedia Pustaka.
- Winarsi, H. 2011. *Antioksidan Alami & Radikal Bebas Potensi dan Aplikasinya Dalam Kesehatan*. Yogyakarta: Kanisius
- Winarsi, H. *Antioksidan Alami dan Radikal Bebas: Potensi dan Aplikasinya dalam Kesehatan*. Yogyakarta: Kanisius. 2007 : 13-15
- Wulandari, D. A., I. Setyaningsih, D. Syafrudin, P. B. S. Asih. 2016. Ekstraksi fikosianin dari *spirulina platensis* dan aktivitas antimalaria secara invitro. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 19(1) : 17-25.



UNIVERSITAS
GADJAH MADA

Mikroemulsi Water in Oil Fikosianin Arthrospira platensis dengan Virgin Coconut Oil sebagai Fase Minyak

Safinati Jannata Zisanti, Dr. R.A. Siti Ari Budhiyanti, S.T.P., M.P.

Universitas Gadjah Mada, 2024 | Diunduh dari <http://etd.repository.ugm.ac.id/>

- Yeniza, A. P. Asmara. Penentuan bilangan peroksida minyak RBD (Refined Bleached Deodorized) olein PT. PHPO dengan metode titrasi iodoometri. AMINA, 1(2) : 79-83.
- Yuwanti, S., Giyarto, R. Akrpman. 2022. Formulasi mikroemulsi minyak sawit dalam air menggunakan kombinasi surfaktan teknis *food grade*. Prosiding Seminar Nasional Agribisnis 2022, 2(1) : 47-50.
- Yuwanti, S., T. Lindriati, R. D. Anggraeni. 2018. Stabilitas, total polifenol, dan aktivitas antioksidan mikroemulsi ekstrak cascara (teh kulit kopi) menggunakan minyak kelapa dan minyak kelapa sawit. Jurnal Agroteknologi, 12(2) : 184-195.