

DAFTAR PUSTAKA

- Abderrezak, K., dan Nouredine, B. (2019). Comparative study of two extraction methods of essential oils from orange peel: microwave-assisted hydrodistillation and conventional hydrodistillation etude comparative. *Reveiew Agrobiologia*, 8, 1058–1065.
- Adapa P, Tabil L, Schoenau G, dan Opoku, A. (2010). Pelleting charac-teristics of selected biomass with and without steam explosion pre-treatment. *Int J Agri Biol Eng*, 3, 62–79.
- Agusta, A.(2000). Minyak atsiri tumbuhan tropika Indonesia. *Penerbit ITB*. Bandung
- Alam, P.N. dan Supardan, M. D. (2011). Ekstraksi Atsiri dari daun jeruk purut (*Citrus hystrix* D.C) dengan menggunakan Pelarut. Baristand Industri Banda Aceh. ISBN,978-602-19327-0-4, 125-133
- Alvira, P., Tomás-Pejö, E., Ballesteros.M., Negro. N.J. (2010).Pretreatmen technologies for an efficient bioethanol production process based on enzymatic hydrolysis: a riewiew.*Bioresour Technol*,101, 4851-61.
- Amenaghawon, A. N., dan Ogbeide, S. E. (2013). Modeling teh kinetics of essential oils recovery from lemon grass (*Cymbopogon* Spp.) by steam distillation. *Journal of Engineering Research*, 18, 115–121.
- Ampasavate, C., Okonogi, S., Anuchapreeda, S. (2010). Cytotoxicity of extracts from fruit plants against leukemic cell lines. *African Journal of Pharmacy and Pharmacology*. 1, 013-021.
- Antal, T., Figiel, A., Kerekes, dan Sikolya, B.L. (2011). Effect of drying methods on the quality of the essential oil of spearmint leaves (*Mentha spicata* L.). *Drying Technology*, 29,1836–1844.
- [AOAC]. 2005. Official Methods of Analysis,Assoc.Off. Agric, Chem, WashingtonD.C.,15 th:136-138
- Assami, K., Pingret, D., Chemat, S., Meklati, B.Y., dan Chemat, F. (2012). Ultrasound induced intensification and selective extraction of essential oil from *Carum carvi* L. seeds. *Chemical Engineering and Processing*, 62, 99-105

- Azimain, N., Abdullah, N., Noor, Z.M., Zulkifli, K.S.dan Kamarudin, W.S.S.D. (2012). Phytochemical constituents and in vitro bioactivity of ethanolic aromatic herbs extracts. *Sains Malaysiana*, 41, 1437-1444.
- Babu, G. D. K., dan Singh, B. (2009). Simulation of Eucalyptus cinerea oil distillation:: A study on optimization of 1,8 cineole production. *Biochemical Engineering Journal*, 44, 226–231. <https://doi.org/10.1016/j.bej.2008.12.012>
- Baser, K.H.C. (1999). Essential oil extraction from natural product by conventional methods. TBAM-ICS/UNIDO Training Course on quality improvement of essential oil. 15-19 November 1999. Eskisehir. Turkey
- Bayramoglu, B., Sahin, S., dan Sumnu, G. (2008). Solvent-free microwave extraction of essential oil from Oregano. *Journal of Food Engineering*, 88, 535–540. <https://doi.org/10.1016/j.jfoodeng.2008.03.015>
- Benavente-Garcia, O., Castillo, J., Marin, F.R., Ortufio, A., dan Del Rio, J.A. (1997). Uses and properties of citrus flavonoids. *Journal of Agricultural and Food Chemistry*, 45, 4505-5415
- Bennici, A., dan Castillo, O. (2004). Anatomical and ultrastructural study of the secretory cavity development of *Citrus sinensis* and *Citrus limon*: evaluation of schizolysigenous ontogeny. *Floral-Morphol. Distrib. Funct. Ecol. Plants*, 199, 464-475
- Benyoussef, E., Beddek, N., Zouaghi, N., dan Belabbes, R. (2004). Bearing plants isolation of Coriander oils by different processes. *Journal of Essential Oil-Bearing Plants*, 2, 129–135. <https://doi.org/10.1080/0972-060X.2004.10643379>
- Berry, S.L., dan Roderick, M. L. (2005). Plant-water relations and the fibre saturation point. *New Phytologist*. 168, 25-37.
- Boluda-aguilar, M., García-vidal, L., González-castañeda, F. P., dan López-gómez, A. (2010). Bioresource technology Mandarin peel wastes pretreatment with steam explosion for bioethanol production. *Bioresource Technology*, 101, 3506–3513. <https://doi.org/10.1016/j.biortech.2009.12.063>
- Boluda-aguilar, M., dan López-gómez, A. (2013). Production of bioethanol by fermentation of Lemon (*Citrus limon* L.) peel wastes pretreated with steam explosion. *Industrial Crops and Products*, 41, 188–197. <https://doi.org/10.1016/j.indcrop.2012.04.031>

- Braddock, R.J. (1999). Handbook of citrus by-products and processing technology. *John Wiley & Sons, Inc. New York*. Chapter 12: 180-181
- Brownell, H.H., Yu, E.K.C., dan Saddler, J.N. (1986). Steam-explosion pretreatment of wood: Effect of chip size, acid, moisture content and pressure drop. *BIOTECHNOLOGY and BIOENGINEERING*. 28, 792-801
- Buchaillot, A., Caffin, N., dan Bhandari, B. (2009). Drying of Lemon Myrtle (*Backhousia citriodora*) Leaves: Retention of Volatiles and Color. *Drying Technology*, 27(August 2014), 445–450. <https://doi.org/10.1080/07373930802683740>
- Bousbia N., Vian, M. A., Ferhat, M. A., Petitcolas, E., Meklati, B. Y., dan Chemat, F. (2009). Comparison of two isolation methods for essential oil from rosemary leaves: Hydrodistillation and microwave hydrodiffusion and gravity. *Journal of Food Chemistry*, 114, 355-36
- Butryee, C., Sunpuang, P., dan Chitchumroonchokchaic. (2009). Effect of processing on the flavonoid content and antioxidant capacity of *Citrus hystrix* leaf. *International Journal Food Sciences and Nutrition*, 1, 1-13. [.doi.org/10.1080/09637480903018816](https://doi.org/10.1080/09637480903018816)
- Cantarella, M., Cantarella, L.; Gallifuoco, A., Spera, A., dan Alfani, F. (2004). Effect of inhibitors released during steam-explosion treatment of poplar wood on subsequent enzymatic hydrolysis and SSF. *Biotechnol*, 20, 200-206. doi: 10.1021/bp0257978.
- Cassel, E., Vargas, R. M. F., dan Joseph, P. (2006). Experiments and modeling of the *Cymbopogon winterianus* Essential oil extraction by steam distillation. *Journal Mex. Chem. Soc*, 50(3), 126–129.
- Cara, C., Ruiz, E., Ballesteros, M., Manzanares, P., Negro, M. J., dan Castro, E. (2008). Production of fuel ethanol from steam-explosion pretreated olive tree pruning. *Fuel*, 87, 692-700.
- Chaisawadi, S., Thongbute, D., Methawiriyasilp, W., Pitakworarat, N., Chaisawadi, A., dan Jaturonrasamee, K. (2005). Preliminary study of antimicrobial activities on medical herbs of Thai food ingredients. *Acta Hort (ISHS)*, 675, 111-114
- Chen, H., dan Liying, L. (2007). Unpolluted fractionation of wheat straw by steam explosion and ethanol extraction. *Bioresource Technology*, 98, 666-676.

- Chen, G., dan Chen, H. (2011). Extraction and deglycosylation of flavonoids from sumac fruits using steam explosion. *Food Chemistry*, 126, 1934–1938.
- Chen, H.Z, dan Fu, X.G. (2016). Industrial technologies for bioethanol production from lignocellulosic biomass. *Renew Sustain Energy Rev*, 57: 468-478
- Cheong, M. W., Liu, S. Q., Zhou, W., Curran, P., dan Yu, B. (2012). Chemical composition and sensory profile of Pomelo (*Citrus grandis* (L .) Osbeck) juice. *Food Chemistry*, 135, 2505–2513.doi.org/10.1016/j.foodchem.2012.07.012.
- Chilvia, A.R., 2014. Penerapan Pulsed Eclectric Field (*PEF*) pada ekstraksi minyak atsiri daun jeruk purut (*Citrus hystrix*) dengan metode destilalsi air dan uap (*water and steam distillation*). Skripsi. Fakultas Teknologi Pertanian. Universitas Brawijaya. Malang.
- Ching, L.S., dan Mohamed, S. (2001).Alpha-tocopherol62 content in edible tropical plants. *J. Agric Food Chem*, 49, 3101-3105
- Choi, W. I., Lee, E. H., Choi, B. R., Park, H. M. dan Ahn, Y. J. (2003): Toxicity of plant essential oils to Tri-aleurodes vaporariorum (Homoptera: Aleyrodidae). *J. Econ. Entomol*, 96, 1479–1484
- Choi,H.S., dan Sawamura, M. (2000). Composition of the essential oil of *Citrus tamurana* Hort.ex Tanaka (Hyuganatsu).*J. Agric. Food Chem*, 48, 4868 - 4873.
- Chornet, E., Overend, R.P., dan Marzetti, A. (1991). Phenomenological kinetics and reaction engineering aspects of steam/aqueous treatments. *Proceedings of the international workshop on steam explosion techniques*. Milan Italy. pp: 21 - 58.
- Chueahongthong, F., Ampasavate, C., Okonogi, S., Tima, S., dan Anuchapreeda, S. (2011). Cytotoxic effects of crude kaffir lime (*Citrus hystrix*, DC.) leaf fractional extracts on leukemic cell lines. *Journal of Medicinal Plants Research*, 5(14), 3097–3105. Retrieved from <http://www.academicjournals.org/JMPR>
- Colecio-Juárez, M. C., Rubio-Núñez, R. E., Botello-Álvarez, J. E., Martínez-González, G. M., Navarrete-Bolaños, J. L., dan Jiménez-Islas, H. (2012). Characterization of volatile compounds in the essential oil of Sweet Lime (*Citrus limetta* Risso). *Chilean Journal of Agricultural Research*, 72, 275–280.
- Coll, L., Saura, D., Ruiz, M.P., Ros, J.M., Canovas, J.A., dan Laencina, J. (1995). Viscometric control in teh enzymatic extraction of citrus peel oils. *Food Control*, 3, 143–146.

- Cui, Z.W., Shi-Ying Xu, S.Y., dan Sun, D.W. (2004). Effect of microwave-vacuum drying on the carotenoids retention of carrot slices and chlorophyll retention of Chinese chive leaves. *Drying Technology*, 22, 563–575, <https://doi.org/10.1081/DRT-120030001>
- Dalimartha, S. (2006). Tumbuhan Obat Indonesia II. *Niaga Swadaya*. Jakarta. hal, 93-94
- Dawidowicz, A.L., Rado, E., Wianowska, D., Mardarowicz, M., dan Gawdzik, J. (2008). Application of PLE for the determination of essential oil components from *Thymus Vulgaris* L. *Talata*, 76, 878-884.
- Diaz-Maroto, M.C., Pérez-Coello, M.S, Viñas, G.M.A., dan Cabezudo, M.D. (2003). Influence of drying on the flavor quality of spearmint (*Mentha spicata* L.) . *J. AgricFood Chem.*, 51, 1265-1269.
- Dobreva, A., Tintchev, F., Heinz, V., Schultz, H., dan Toepfl, S. (2010). Effect of pulsed electric fields (PEF) on oil yield and quality during distillation of white oil-bearing rose (*Rosa alba* L.). *Z Arznei-Gewurzpfla*, 15, 127-132.
- Dorado, C., Cameron, R. G., dan Manthey, J. A. (2019). Study of static steam explosion of *Citrus sinensis* juice processing waste for the isolation of sugars, pectic hydrocolloids, flavonoids, and peel oil. *Food and Bioprocess Technology*, 12, 1293–1303.
- Dyah, S., Mamik, P.R., dan Rini, P. (2009). Efek penolak serangga dan larvasida ekstrak daun jeruk purut terhadap aedes aegypti. Fakultas Farmasi. Universitas Setia Budi. Surakarta.
- Earle, R.,L. (1983). Unit Operations in Food Processing. Second Edition. Massey University. New Zealand-Pergamon Press. p: 87-89.
- Ferhat, A., Fabiano-Tixier, A.S., Maataoui, M.E., Maingonnat, J.F., Romdhane, M., dan Chemat, F. (2011). Microwave steam diffusion for extraction of essential oil from oregano peel: kinetic data, extract's global yield and mechanism. *Food Chem.*, 125, 255-261.
- Ferhat, M.A., Meklati, B.Y., Smadja, J., dan Chemat, F. (2006). An improved microwave clavier apparatus for distillation of essential oils from orange peel. *Journal of Chromatography A*, 1112, 121-126

- Fessenden R.J., dan Fessenden, J.S. (1986). Kimia Organik Jilid 2. Edisi 3. Terjemahan A.H. Pudjaatmaka. Jakarta: Penerbit Erlangga
- Fortin, H., Vigora, C., Lohezic-Le, F., Robina, V., Le Bosse, B., Boustiea, J., dan Arnoros, M. (2002). In vitroantiviral activity of thirty-six plants from La Reunion Island. *Fitoterapia*. 3, 346-350
- Furniss, B.S., A.J. Hannaford, V. Rogers, P.W.G., Smith, dan Tatchell, A.R. (1980). Vogels Textbook of Practical Organic Chemistry (Fourth Ed.) The English Language Book Society and Longman. P: 100-136.
- Gachovska, T., Cassada, D., Subbiah, J., Hanna, M., Thippareddi, H., dan Snow, D. (2010). Enhanced anthocyanin extraction from red cabbage using pulsed electric field processing. *J.Food Sci.*, 75, E323-E329.
- Glasser, W.G., dan Wright, R.S. (1998). Steam assisted biomass fraction II. Fractionation behavior of various biomass resources. *Biomass and Bioenergy*, 14, 219-235
- Golmakani, M.T., dan Rezaei, K. (2008). Comparison of microwave-assisted hydrodistillation with the traditional hydrodistillation method in the extraction of essential oils from *Thymus vulgaris* L. *Food Chemistry*, 109, 925-930.
- Golmohammadi, M., Borghei, A., Zenouzi, A., Ashrafi, N., dan Taherzadeh, M. J. (2018). Optimization of Essential Oil Extraction from Orange Peels using Steam Explosion. *Heliyon*, 4, 1-18. doi.org/10.1016/j.heliyon.2018.e00893
- Gonçalves, D., Koshima, C.C., Nakamoto, K.T., Umeda, T.K., Aracava, K.K., Gonçalves, C.B., dan Rodrigues, C.E.C. (2014). Deterpenation of eucalyptus essential oil by liquid + liquid extraction: Phase equilibrium and physical properties for model systems at $T = 298.2$ K. *The Journal of Chemical Thermodynamics*, 69, 66 - 72
- Granato, D., De Castro, I.A., Piekarski, F.V.B.W., Beninca, C., dan Masson, M.L. (2011). Influence of passion fruit juice on colour stability and sensory acceptability of non-sugar yacon-based pastes. *Brazilian Archives of Biology and Technology*. 54, 149-159.
- Guenther, E. (1987). The essential oils. Penerjemah S.Ketaren. Minyak Atsiri (Jilid I). UI-Press, Jakarta. h.20-33, 99-129
- Harimurti, N., Soerawidjaja, T. H., Sumangat, D., dan Risfaheri. (2012). Ekstraksi

minyak nilam (*Pogostemon Cablin* Benth) dengan teknik hidrodifusi pada tekanan 1-3 bar. *Jurnal Pascapanen*, 9(1), 1–10.

Hidayat, F.K. (1999). Ekstraksi minyak atsiri dari daun jeruk purut (*Citrus hystrix* DC) pada skala pilot *plant*. Skripsi. Jurusan Teknologi Pangan dan Gizi. Fakultas Teknologi Pertanian. Institut Pertanian Bogor. Bogor

Hongratanaworakit, T., dan Buchbauer, G. (2007). Chemical composition and stimulating effect of *Citrus hystrix* oil on Humans. *Flavour and Fragrance Journal*, 22, 443–449. <https://doi.org/10.1002/ffj>

Ho, Y.S. (2004). Citation review of Lagergren kinetic rate equation on adsorption reactions. *Scientometrics*. 59, 171-177.

Hutadilok-Towatana, N., Chaiyamutti, P., Panthong, K., Mahabusarakan, W., dan Rukachaisirikul, V. (2006). Antioxidatives and free radical scavenging activities of some plants used in Thai folk medicine. *Pharmaceutical Biology*, 44, 221-228

Hutapea, Ria, J. (1993). Inventaris Tanaman Obat Indonesia Jilid IV. hal, 18-25. Jakarta. Depkes RI.

Hutchings, J. B. (1999). Food Colour and Appearance. Aspen Publishers.Inc. hal, 327-333

Imron, M. (2008). Pengaruh ukuran perajangan bahan baku daun jeruk purut terhadap rendemen minyak atsiri pada proses pemisahan dengan *water and steam destilator*. Program Studi Magister Sistem Teknik. Program Pascasarjana. Universitas Gadjah Mada. Yogyakarta

Iroba, K. L., Tabil, L. G., Sokhansanj, S., dan Dumonceaux, T. (2014). Pretreatment and Fractionation of Barley Straw using Steam Explosion at Low Severity Factor. *Science Direct*, 66, 286–300.

Jacquet, N., Vanderghem, C., Danthine, S., Quievy, N., Blecker, C., Devaux, J., dan M, Paquot. (2012). Influence of steam explosion on physicochemical properties and hydrolysis rate of pure cellulose fibers. *J.Bioresource Technology*. 121 : 221-227

Janositz, A., dan Knorr, D. (2010). Microscopic Visualization of Pulsed Electric Field induced changes on Plant Cellular Level. *Innovative Food Science and Emerging Technologies*, 11(4), 592–597. <https://doi.org/10.1016/j.ifset.2010.07.004>

- Jatan, I., Ahmad, A. S., Ahmad, A. R., Ali, N.A.M., dan Ayop, N. (1996). Chemical composition of some citrus oils from Malaysia. *Journal Essent.Oil Res.*, 8, 627-632.
- Jiao, J., Gai, Q., Fu, Y., Zu, Y., Luo, M., Wang, W., dan Zhao, C. (2013). Microwave-assisted ionic liquids pretreatment followed by hydro-distillation for the efficient extraction of essential oil from *ryopteris fragrans* and evaluation of its antioxidant efficacy in sunflower oil storage. *Journal of Food Engineering*, 117, 477–485. doi.org/10.1016/j.jfoodeng.2012.10.024.
- Jimoh, S. O., Labo-popoola, O. H., dan Alabi, K. A. (2017). Radical scavenging capacity and efficacy of *Myristica fragrans* (Nutmeg) metabolites on *cladosporium herbarum* of food origin. *Microbiology Research Journal International*, 20(1), 1–8. doi.org/10.9734/MRJI/2017/31962.
- Juan, M. R.G., Antonio, L. M., Guillermo, R. G., Manuel, M., Encarnacion, R., Juan, F. B., dan Eulogio, C. (2016). Obtaining sugars and natural antioxidants from olive leaves by steam-explosion. *Food Chemistry*, 210. <http://doi.org/10.1016/j.foodchem.2016.05.003>.
- Juliarni, Dewanto, H.A., dan Ermayanti, T.M. (2007). Karakter Anatomi Daun dari Kultur Tunas *Artemisia annua* L. Leaf Anatomical Characters from Shoot Culture of *Artemisia annua* L. *Bul. Agron.*, 35, 225 – 232
- Kamm, B., Schönicke, P., dan Hille, Ch.(2015). Green Biorefinery - industrial implementation, *Food Chemistry*, 197, 1341 - 1345.
- Karakaya, S., El, S.N., Karagozlu, N., Sahin, S., Sumnu, G., dan Bayramoglu, B. (2012). Microwave-assisted hydrodistillation of essential oil from rosemary. *J Food Sci Technol*, 51, 1056-1065. DOI 10.1007/s13197-011-0610-y
- Kasuan, N., Muhammad, Z., Yusoff, Z., Rahiman, M.H.F., Taib, M.N., dan Haiyee, Z.A. (2013). Extraction of *Citrus hystrix* DC (Kaffir Lime) essential oil using automated steam distillation process: Analysis of volatile compounds. *Malays. J. Anal. Sci.*, 17, 359–369.
- Kawiji, Khasanah, L. U., Rohula, U., dan Aryani, N. T. (2015). Ekstraksi maserasi oleoresin daun jeruk purut (*Citrus hystrix* DC): optimasi rendemen dan pengujian karakteristik mutu. *Agritech*, 35, 178–184.
- Kemppainen, K., Inkinen, J., Uusitalo, J., Nakari- Setälä, T. dan Siika-aho, M. (2012). Hot water extraction and steam explosion as pretreatments for ethanol production from spruce bark. *Bioresour Technol*, 117, 131 - 139

- Ketaren, S. (1985). Pengantar Teknologi Minyak Astiri. Jakarta. Balai Pustaka
- Khabibi, J. (2011). Pengaruh penyimpanan daun dan volume air penyulingan terhadap rendemen dan mutu minyak kayu putih. Departemen Hasil Hutan. Fakultas Kehutanan. IPB. Bogor.
- Khasanah, L. U., Utami, R., dan Aji, Y. M. (2015). Pengaruh perlakuan pendahuluan terhadap karakteristik mutu minyak atsiri daun jeruk purut (*Citrus hystrix* DC). *Jurnal Aplikasi Teknonologi Pangan*, 4, 48–55.
- Kingsley L., Lope G.T., dan Sokhansanj S. (2014). Pretreatment and fractination of barley straw using steam explosion at low severity factor. *J.Biomass and Bioenergy*, 66: 286-300.
- Knight, T. G., Klieber, A. dan Sedgley, M. (2001). The relationship between oil gland and fruit development in Washington Navel Orange (*Citrus sinensis* L. Osbeck). *Ann. Bot.*, 88, 1039 – 1047.
- Kristensen, J.B., Felby, C., dan Jorgensen, H. (2009). Yield-determining factors in high-solids enzymatic hydrolysis of lignocellulose. *Biotechnol. Biofuels*, 2, 11-16.
- Konoz, E., Abbasi, A., Parastar, H., Moazeni, R.S, dan Jalali-Heravi, M. (2015). Analysis of Olive Fruit essential oil: Application of Gas Chromatography-Mass Spectrometry combined with Chemometrics. *International Journal of Food Properties*, 18, 316–331.
- Kusuma, H.S, dan Mahfud M. (2017). The extraction of essential oils from patchouli leaves (*Pogostemon cablin* Benth) using a microwave air-hydrodistillation method as a new green technique. *Journal of The Royal Society of Chemistry*, 7: 1336-1347.
- Kusuma, H.S, dan Mahfud M. (2016). The extraction of essential oils from sandalwood (*Santalum album*) by microwave air-hydrodistillation method. *J.Mater. Environ. Sci.*, 7, 1597-1606
- Lagergren, S. (1998). About the theory of so-called adsorption of soluble substances. *K. Sven. Vetenskapsakad. Handl.*, 24, 1-39
- Lenardao, E.J., Botteselle, G.V., Azambuja, F., Perin, G dan Jacob, G. (2007). Cironellal as key compound in organic synthesis, *Tetrahedron*, 63, 6671-6712

- Lawrence, B.M, Hoog, J.W, Terhune, S.J., dan Podimuang V. (1973). Chemistry of essential oil Citrus species. Chemistry Departement Gorakhpur University India.
- Lertsatitthanakorn, P., Taweekaisupapong, S., Aromdee, C., dan Khunkitti, W. (2006). In Vitro bioactivities of essential oils used for acne control. *Journal of Aromatherapy*, 16, 43–49. doi.org/10.1016/j.ijat.2006.01.006
- Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants:Volume 4, Fruits. Springer. New York. p:638. doi.org/10.1007/978-94-007-4053-2-76
- Lisawati, Y.(2002). Pengaruh waktu distilasi dan derajat kehalusan (*mesh*) serbuk kayu manis (*cinamomum burmanii* nees ex bl.) terhadap kadar sinamaldehida pada minyak atsirinya. Jurusan Farmasi FMIPA. Universitas Andalas. Padang
- Liu, Y., L. Yang, Y.G., Zu, C.J., Zhao, L., Zhang, Y., Zhang, Z., Zhang, dan Wang, W. (2012). Development of an ionic-based microwave assisted method for simultaneous of proantocyanidins and essential oil in Cortex cinnamomi. *Food Chem.*, 135, 2514-2521.
- Loh, F. S., Awang, R. M., Omar, D., dan Rahmani, M. (2011). Insecticidal properties of *Citrus hystrix* DC leaves essential oil against *Spodoptera litura* fabricius. *Journal of Medicinal Plant Research*, 5, 3739–3744.
- Luckner, M. (1984). Secondary metabolism in microorganisms, plants, and animals. Second Edition. *Springer-Verlag, Berlin, Germany*, 35-37, 41-42, 199-210.
- Lutony, T.L., dan Rahmayati, Y. (1999). Produksi dan perdagangan minyak atsiri. Penebar Swadaya, Jakarta, hal, 35 - 40.
- Mayasari, D., Jayuska, A., dan Wibowo, A.M. (2013). Pengaruh variasi waktu dan ukuran sampel terhadap komponen minyak atsiri dari daun jeruk purut (*Citrus hystrix* DC). *Jurnal Kimia Khatulistiwa*, 2, 74-77
- Ma'mun. (2006). Karakteristik beberapa minyak atsiri famili Zingeraceae dalam perdagangan. *Bul. Littro*, 17, 91–98.
- Manosroi, J., Dhumtanom, P., dan Manosroi, A. (2006). Anti-proliferative activity of essential oil extracted from Thaimedicinal plants on KB and P388 cell lines. *Cancer Letters*, 235, 114–120
- Manzan, A. C. C. M., Toniolo, F. S., Bredow, E., dan Povh, N. P. (2003). Extraction of essential oil and pigments from *Curcuma longa* [L.] by steam distillation and

- extraction with volatile solvents. *Journal of Agricultural and Food Chemistry*, 51, 6802–6807.
- Mayuni. (2006). Teknologi dan analisis minyak atsiri. Andalas University Press, Padang.
- Medina, J. D. C., Woiciechowski, A., Filho, A. Z., Nigam, P. S., Ramos, L. P., dan Soccol, C. R. (2016). Steam explosion pretreatment of oil palm empty fruit bunches (EFB) using autocatalytic hydrolysis: a biorefinery approach. *Bioresource Technology*, 199, 173–180.
- Megawati, dan Kurniawan, R.D.(2015). Ekstraksi minyak atsiri kulit jeruk manis (*Citrus Sinensis*) dengan metode *vacuum microwave assisted hydrodistillation*. *Jurnal Bahan Alam Terbarukan*, 4, 61-67
- Megawati,dan Murniyawati, F. (2015). Microwave assisted hydro-distillation untuk ekstraksi minyak atsiri dari kulit jeruk bali sebagai lilin aromaterapi. *Jurnal Bahan Alam Terbarukan*, 4, 18-26
- Mejri, J., Bouajila, J., Ali, S. B. S., Abderrabba, M., dan Mejri, M. (2012). Ruta chalepensis L. essential oil: chemical composition and phytotoxic activity. *Journal of Biologically Active Products from Nature*, 2, 341 - 352
- Meyer-Warnod, B.(1984). Natural essential oil: extraction processes and application to some major oils perfume. *Flavorist*, 9, 93-104.
- Munawaroh, S. dan Handayani, P.A. (2010). Ekstraksi minyak daun jeruk purut (*Citrus hystrix* DC) dengan pelarut etanol dan N-heksana. *Jurnal Kompetensi Teknik*. 2, 73-78.
- Murakami, A., Nakamura, Y., Koshimizu, K., dan Ohigashi H. (1995). Glyceroglycolipids from Citrus Hystrix, a traditional herb in Thailand, potency inhibit the tumor-promoting activity of 12-O-tetradecanoylphorpol 13-acetate in mouse skin. *Journal of Agricultural and Food Chemistry*, 43, 2779-2783
- Nainggolan, R. (2002). Pemisahan komponen minyak nilam (*Pogostemon Cablin Benth*) dengan teknik distilasi fraksinasi vakum. Penelitian IPB Bogor.
- Nasruddin, Priyanto, G., dan Hamzah, B. (2005). Pengaruh delignifikasi daun nilam (*Pogostemon Cablin Benth*) dengan larutan NaOH dan fermentasi dengan kapang *Trichoderma viride* terhadap minyak hasil penyulingan. *Jurnal Riset Industri*, 2, 94-102

- Navarrete, A., Wallraf, S., Mato, R. B., dan Cocero, M. J. (2018). Improvement of essential oils steam distillation by microwave pretreatment improvement. *Industrial & Engineering Chemistry Research*, 50, 4667–4671. <https://doi.org/10.1021/le102218g>
- Nazari, Ghorbani, Hekmat-Doost, Jeddi-Tehrani, dan Zand, H. (2011). Inactivation of nuclear factor-kB by citrus flavanone hesperidin contributes to apoptosis and chemosensitizing effect in Romos cells. *European Journal of Phamacology*, 650, 526-533
- Negrelle, R. R. B., dan Gomes, E. C. (2007). *Cymbopogon citratus* (D.C) Stapf: chemical composition and biological activities. *Rev Bras Pl Med*, 9, 80-92.
- Ni, S., Zhao, W., Zhang, Y., A., M. A., Gamalla, dan Yang, R. (2016). Efficient and eco-friendly extraction of corn germ oil using aqueous ethanol solution assisted by steam explosion. *Journal Food Sciien and Technology*, 45, 230-235
- Nisak, H., Wignyanto, dan Rahmah, N. L. (2014). Ekstraksi melati putih menggunakan teknologi kejut listrik terhadap mutu minyak atsiri concrete (kajian rasio bahan baku, pelarut heksana, dan lama kejutan listrik). *Journal Industria*, 3, 43–52.
- Noda, Y., Asada, C., Sasaki, C., Hashimoto, S., dan Nakamura, Y. (2013). Extraction method for increasing antioxidant activity of raw garlic using steam explosion. *Biochemical Engineering Journal*, 73, 1–4. doi.org/10.1016/j.bej.2013.01.013
- Noda, Y., Asada, C., Sasaki, C., dan Nakamura, Y. (2018). Effects of hydrothermal methods such as steam explosion and microwave irradiation on extraction of water soluble antioxidant materials from garlic husk. *Waste and Biomass Valorization*, 18, 353-358. doi.org/10.1007/s12649-018-0353-3
- Nor, O.M. (1999). Volatile aroma compounds in Citrus hystrix oil. *J. Trop. Agric. Food Sci.*, 27, 225–229.
- Norkaew, O., Pitija, K., Pripdeevech, P., Sookwong, P., dan Wongpornchai, S. (2013). Supercritical fluid extraction and gas chromatographic-mass spectrometric analysis of terpenoids in fresh Kaffir lime leaf oil. *Chiang Mai J. Sci.*, 40, 240–247
- Nugraheni, K.S. (2012). Pengaruh perlakuan pendahuluan dan metode Distilasi terhadap karakteristik mutu minyak atsiri daun kayu manis. Fakultas Pertanian. Universitas Sebelas Maret Surakarta. Surakarta.

- Ogawa, K., Kawasaki, A., Omura, M., Yoshida, T., Ikoma, Y. dan Yano, M. (2001). 3',5'-Di-C- β -glucopyanosylphloretin, a flavonoid characteristic of the genus *Fortunella*. *Phytochemistry*, 57, 737–742.
- Ojha, A., Misrha, M., A.N, S., dan Singh, M. (2018). Antimicrobial activity of Lemon Grass (*Cymbopogon citratus*) extract against microbes of environment and food origin. *International Journal of Current Science Research*, 4, 1525–1534.
- Othman, S.N.A.Md., Hassan, M.A, Nahar, L., Basar, N., Jamil, S., dan Sarker, S.D. (2016). Essential oils from teh Malaysian Citrus (Rutacea). *Medicinal Plants. Medicines*, 3, 13, doi:10.3390/medicines3020013
- Paramasari, I.(2017). The volatil compounds and odor characters of Tom Yum Paste. Tesis. Program Studi Ilmu dan Teknologi Pangan. Fakultas Teknologi Pertanian. Universitas Gadjah Mada. Yogyakarta
- Park, H.J., Kim, Ha, E., dan Chung.(2008). Apoptosis effect of hesperidin through caspase 3 activation in human colon cancer cells, SNU-C4. *Phytomedicine*, 15, 147-151
- Periyanayagam, K., Dhanalakshmi, S., dan Karthikeyan, V. (2013). Pharmacognostical, SEM and Edax profile of the leaves of *Citrus aurantium* L. (Rutaceae). *Journal of Health Sciences*, 1, 1–5.
- Phoungchandang, S., Srinukroh, W., dan Leenanon, B. (2008). Kaffir lime leaf (*Citrus hystrix* DC .) drying using tray and heat pump dehumidified Drying. *Drying Technology*, 26, 1602–1609. doi.org/10.1080/07373930802467490
- Pudil, F., Wijaya, H., Volfora, J., valentova, H., dan Pokorny, J. (1998). Change in citrus *hystrix*. oil during autooxidation. In E.T. Contis et al, eds . *Food Flavors: formation, analysis and Packaging influences*. Amsterdam: Elsevier Science B.V, p, 707-718
- Rahardja, J. (1993). Pembuatan ekstrak flavor daun jeruk purut (*Citrus hystrix* DC). Skripsi. Fakultas Teknologi Pertanian. IPB. Bogor
- Raksakantong, P., Siriamornpun, S., & Meeso, N. (2012). Effect of drying methods on volatile compounds , fatty acids and antioxidant property of Thai kaffir lime (*Citrus hystrix* D . C .). *Food Science & Technology*, 46(October 2011), 603–612. <https://doi.org/10.1111/j.1365-2621.2011.02883.x>
- Rassem, H. H. A., Nour, A. H., dan Yunus, R. M. (2016). Techniques for extraction of

essential oils from plants: A Review. *Australian Journal Of Basic And Applied Sciences*, 10, 117–127.

Ratseewo, J., Tangkhawanit, E., Meeso, N., Kaewseejan, N., dan Siriamornpun, S. (2016). Changes in antioxidant properties and volatile compounds of kaffir lime leaf as affected by cooking processes. *International Food Research Journal*, 23, 188–196.

Reineccius, G. (2006). Flavor chemistry and technology. Taylor & Francis Group. CRC Press

Reverchon, E., dan Porta, G.D. (1995). Supercritical CO₂ extraction and fractionation of lavender essential oil and waxes. *J. Agric. Food Chem.*, 43, 1654-1658.

Ririn, M. 2010. Perbandingan rendemen minyak atsiri pada daun jeruk purut (*Citrus hystrix* folium) kering dan basah dengan Distilasi air. Politekkes Bakti Mulia. Sukoharjo

Romero-García, J.M., Lama-Muñoz, Rodríguez-Gutiérrez, G., Moya, M., Ruiz, E., Fernández-Bolaños, J., dan Castro, E. (2016). Obtaining sugars and natural antioxidants from olive leaves by steam-explosion. *Food Chemistry*, 210, 457-465

Sait, S., dan Lubis, E. (1991). Potensi Minyak Atsiri Indonesia sebagai Tanaman Obat. BPTO. Bogor

Sanchez, O.J., dan Cardona, C.A.(2008). Trends in biotechnology production of fuel ethanol from different feedstock. *Bioresour. Technol*, 99, 5270-5295

Sastrohamidjojo. (2004). Kimia Minyak Atsiri. Gadjah Mada University Press. Yogyakarta. h.7-12

Sarip, H., Hossain, Md. S., Azemi, M.M.N., dan Karim, A. A. (2016). Review of the thermal pretreatment of lignocellulosic biomass towards glucose production: autohydrolysis with DIC. *Technology. BioResources*, 11, 10625-10653.

Scalia, S., Villani, A., Vadelli, M.A., dan Forni, F. (1998). Complexation of the sunscreen agent, buthymethoxydibenzoylmethane, with hydroxypropyl (beta)-cyclodextrin. *Int.J.Pharm*, 175, 205-213

Shafiei, M., Kumar, R., dan Karimi, K.(2015). Pretreatment of lignocellulosic biomass. *Springer International Publishing*. pp, 85-154.

- Shamala, T.R., Manonmani, H., Venkateswaran, G., Sowbhagya, H.B., Sampathu, S.R., dan Joseph, R. (2005). An enzymatic process for the preparation of spice oil U.S. Patent WO/2005/063953
- Sato, A., Asano, K., dan Sato, T. (2005). The chemical composition of *Citrus hystrix*.DC. *J.Essential Oil*, Rev.2, 179-183.
- Sauid, S. M., & Aswandi, F. A. (2018). Extraction methods of essential oil from kaffir lime (*Citrus hystrix*). *Malaysian Journal of Chemical Engineering & Technology*, 1, 56–64.
- Serpen, A., dan Gokmen, V. (2009). Evaluation of the Maillard reaction in potato crisps by acrylamide, antioxidant capacity, and colour. *Journal of Food Composition and Analysis*, 22, 589-595.
- Setiyoningrum, F., Lioe, H.N., Apriyantono, A., dan Abbas, A. (2018). Drying and pulverization processes affect the physico-chemical properties of kaffir lime leaves (*Citrus hystrix* DC). *International Food Research Journal*, 25, 2620-2627.
- Setyawati, Y. (2013). Sitotoksitas dan apoptosis ekstrak daun jeruk purut (*Citrus hystrix* D.C.) terhadap Sel HeLa (Human Cervical Cancer Cell Line). Skripsi. Fakultas Biologi. Universitas Gajah Mada. Yogyakarta
- Shahhoseini, R., Ghorbani, H., Karimi, S. R., Estaji, A., dan Moghaddam, M. (2013). Qualitative and quantitative changes in the essential oil of Lemon Verbena (*Lippia citriodora*) as Affected by Drying Condition. *Drying Technology*, 31, 37–41. doi.org/10.1080/07373937.2013.771649
- Soe'eib, S., Asri, N. P., N.H, A. . dwi S., dan Agustina, D. (2016). Enfleurage essential oil from jasmine and rose using cold fat adsorbent. *Journal Ilmiah Widya Teknik*, 15, 58–61.
- Sonwa, M.M. (2000). Isolation and structure elucidation of essential oil constituents (comparative study of the oils of *Cyperus alopecoides*, *Cyperus papyrus*, and *Cyperus rotundus*). Dissertation. Departement of Organik Chemistry. Faculty of Chemistry. University of Hamburg. Hamburg.
- Sowbhagya, H. B., Purnima, K. T., Florence, S. P., Rao, A. G. A., dan Srinivas, P. (2009). Evaluation of enzyme-assisted extraction on quality of garlic volatile oil. *Food Chemistry*, 113, 1234–1238. doi.org/10.1016/j.foodchem.2008.08.011

- Sowbhagya, H. B., Srinivas, P., dan Krishnamurthy, N. (2010). Effect of enzymes on extraction of volatiles from celery seeds. *Food Chemistry*, 120, 230–234. /doi.org/10.1016/j.foodchem.2009.10.013
- Sriuskh, V., Tribuddharath, C., Nukoolkarn, V., Bunyaphatsarac, N., Chokeyhaibulkid, K., Phoomniyomb, S., Chuanphungb, S., dan Srifuengfung, S. (2012). Antibacterial activity of essential oils from *Citrus hystrix* (Makrut Lime) against respiratory tract pathogens, *Science Asia*, 38, 212-217
- Stashenko EE, Jaramillo BE, Martínez JR. 2004a. Comparison of different extraction methods for the analysis of volatile secondary metabolites of *Lippia alba* (Mill.) N.E. Brown, grown in Colombia, and evaluation of its *in vitro* antioxidant activity. *J Chromatogr A*, 1025: 93-103
- Stashenko EE, Jaramillo BE, Martínez JR 2004b. Analysis of volatile secondary metabolites from Colombian *Xylopia aromatica* (Lamarck) by different extraction and headspace methods and gas chromatography. *J Chromatogr A*, 1025: 105-113.
- Sudarmadji, S., Haryono, B., dan Suhardi. (2003). Prosedur analisa untuk bahan makanan dan pertanian Edisi kedua. Penerbit Liberty. Yogyakarta. Hal. 63-68
- Sui, W., dan Chen, H. (2014). Multi-stage energy analysis of steam explosion process. *Chemical Engineering Science*, 116, 254–262
- Sukardi, A., Rivita, Pulungan, M.H., dan Mulyadi, A.F. (2014). Penerapan PEF (*Pulsed Electric Field*) pada ekstraksi minyak atsiri daun jeruk purut (*Citrus hystrix* DC) dengan metode destilasi air dan uap. *Skripsi*. Universitas Brawijaya. Malang
- Sulaswatty, A., Wuryaningsih, dan Hartati, S. (2003). Pemurnian minyak nilam (*Pogostemon cablin* Benth) menggunakan teknik ekstraksi fluida superkritik. *Kedeputan Ilmu Pengetahuan Teknik*, Pusat Penelitian Informatika, Jakarta, LIPI
- Surburg, H., dan Paten, J. (2006). Common Fragrance and Flavor Materials preparation, Properties, and Uses. Edisi kelima. Wiley-VCH. Weinheim
- Sun, X. F., Xu, F., Sun, R. C., Fowler, P., dan Baird, M. S. (2005). Characteristics of degraded cellulose obtained from steam-exploded wheat straw, *Carbohydr. Res.*, 340, 97-106.

- Syarifah, T. (2017). Ekstraksi minyak atsiri dari batang, daun dan kulit jeruk purut (*Citrus hystrix* DC) dengan metode solvent-free microwave extraction. Tesis. Fakultas Teknologi Industri. Institut Teknologi Sepuluh November. Surabaya
- Talebnia, F., Karakashev, D., dan Angelidaki, I. (2010). Production of bioethanol from wheat straw: An overview on pretreatment, hydrolysis and fermentation. *Bioresour. Technol.*, 101, 4744–4753.
- Teixeira, B., Marques, A., Ramos, C., Neng, N. R., Nogueira, J. M. F., Saraiva, J. A., dan Nunes, M. L. (2013). Chemical composition and antibacterial and antioxidant properties of commercial essential oil. *Industrial Crops and Products*, 43. <http://doi.org/10.1016/j.indcrop.2012.07.069>
- Thavara, U., Tawatsin, A., Bhakdeenuan, P., Wongsinkongman, P., Boonruad, T., Bansiddhi, J., Chavalittumrong, P., Komalamisra, N., Siriyasatien, P., dan Mulla, M.S. (2007). Repellent activity of essential oils against cockroaches (Dictyoptera: Blattidae, Blattellidae, and Blaberidae) in Thailand. *Southeast Asian J Trop Med Public Health*, 38, 663–673
- Tjitrosoepomo, G. (1994). Morfologi Tumbuhan. Gadjah Mada. University Press. Yogyakarta
- Tooyserkani, Z., Kumar, L., Sokhansanj, S., Saddler, J., Bi, X.T., dan Lim, C.J. (2013). SO₂-catalyzed steam pretreatment enhances the strength and stability of softwood pellets. *Bioresour. Technol.* 130, 59
- Triana, A.W. (20013). Ekstraksi minyak atsiri biji kemukus dengan metode microwave assisted hydrodistillation. *Fakultas Teknik. Universitas*, Negeri Semarang
- Turner, G. W., Gershenzon, J., dan Croteau, R. B. (2000). Distribution of peltate glandular trichomes on developing leaves of eppermint. *Plant Physiology*, 124, 655–663.
- Ustun-argon, Z., Ilhan, N., Gökyer, A., Ozturk, S. B., dan Koparal, B. (2019). Phytochemical evaluation of morus alba seeds and cold pressed oil. *JOTCSA*, 6(1), 41–50.
- Utami, R., Kawiji, Khasanah, L.U., dan Nasution, M.I.A.(2017). Preservative effects of kaffir lime (*Citrus hystrix* DC) leaves oleoresin incorporation on cassava starch-based edible coatings for refrigerated fresh beef. *International Food Research Journal*, 24, 1464-1472.

- Viola, E., Cardinale, M., Santarcangelo, R., Villone, A., dan Zimbardi. (2008). Ethanol from eel grass via steam explosion and enzymatic hydrolysis. *Biomass Bioenergy*, 32, <http://doi.org/10.1016/i.biombioe.2007.12.009>
- Voo, S. S., Grimes, H. D., dan Lange, B. M. (2012). Assessing the biosynthetic capabilities of secretory glands in citrus peel. *Plant Physiol*, 159, 81–94. doi.org/10.1104/pp.112.194233
- Wahyuni, F.Y. (2009). Pengaruh Dosis Pupuk Nitrogen Terhadap Produksi Biomassa dan Minyak Atsiri Dua Varietas Nilam(*Pogostemon cablin* Benth). Skripsi. Fakultas Pertanian.Universitas Jember. Jember
- Wang, L., Ding, L., Li, T., Zhou, X., Wang, L., Zhang, H., Liu, L., Li, Y., Liu, Z., Wang, H., Zeng, H., dan He, H. (2006). Improved solvent-free microwave extraction of essential oil from dried *Cuminum cyminum* L. and *Zanthoxylum bungeanum* Maxim. *Journal of Chromatography A*, 1102, 11-17
- Wanyo, P., Siriamornpun, S., dan Meeso, N. (2010). Improvement of quality and antioxidant properties of dried mulberry leaves with combined far-infrared radiation and air condition in Thai Tea Process. *Food and Bioproducts Processing*, 89(1), 22–30. <https://doi.org/10.1016/j.fbp.2010.03.005>
- Ward, O. P., dan Moo-Young, M. (1989). Enzymatic degradation of cell wall and related plant polysaccharides. *Grit. Rev. Biotechnol*, 8, 237-274.
- Warsito, Noorhanmdani, Sukardi, dan Suratmo. (2017). Aktivitas antioksidan dan antimikrobia minyak jeruk purut (*Citrus hystrix* DC.) dan komponen utamanya. *Journal of Environmental Engineering & Sustainable Technology*, 04, 13–18.
- Waterman, H. I., dan Elsbach, E. B. (2010). The quantitative study of the oxidation of citronellal. *Recueil Des Travaux Chimiques Des Pays-Bas*, 53(8), 730–736. [doi:10.1002/recl.19340530808](https://doi.org/10.1002/recl.19340530808)
- Waikedre, J., Dugay, A., Barrachina, I., Herrenknecht, C., Cabalion, P., dan Fournet, A. (2010). Chemical composition and antimicrobial activity of the essential oils from New caledonian *Citrus macroptera* and *Citrus hystrix*. *Chemistry & Biodiversity*, 7, 871-877. <http://dx.doi.org/10.1002/cbdv.200900196>
- Widmer, W., Zhou, W., dan Grohmann, K. (2010). Bioresource technology pretreatment effects on orange processing waste for making ethanol by simultaneous saccharification and fermentation. *Bioresource Technology*, 101, 5242–5249. <https://doi.org/10.1016/j.biortech.2009.12.038>

- Wijaya, H. (1995). Oriental natural citarasa: liquid and spray dreied of “jeruk purut (Citrus hystrix DC) leaves in Food Citarasa: generation, analysis, and Process influence. G.Charalambous (Ed.) p.Elsevier, Amsterdam, New York, Tokyo
- Wijaya, C.H. (2010). Compositional analysis: Asia-Indonesia. Citrus Essential Oils (Flavor & Fragnance, New Jersey: John Wileyand Sons Inc.
- Woelaningsih, S. 1984. Penuntun Praktikum Botani Dasar.Laboratorium Anatomi Tumbuhan Fakultas Biologi UGM, Yogyakarta.
- Wulandari, Y.W., Anwar, C., Supriyadi. (2019). Comparison between hydro distillation with steam explosion and conventional hydrodistillation in kaffir lime oil extraction. *Agritech*, 39, 306-314.
- Xu, L., Zhan, X., Zeng, Z., Chen, R., Li, dan Xie. (2011). Recent advances on supercritical fluid extraction of essential oils. *African Journal of Pharmacy and Pharmacology*, 5(9), 1196–1211. <https://doi.org/10.5897/AJPP11.228>
- Yi, J., Xin, L., Qi, Z., dan Xisheng, W. (2016). Steam explosion technology based for oil extraction from Sesame (*Sesamum indicum* L.) seed, *Journal of the Saudi Society of Agricultural Sciences*, 243, 7
- Yousif, A. N., Scaman, C. H., Durance, T. D., dan Girard, B. (1999). Flavor volatiles and physical properties of vacuum-microwave and air-dried Sweet Basil (*Ocimum basilicum* L .). *Journal of Agricultural and Environmental Management*, 47, 4777–4781.
- Yu, Z., Zhang, B., Yu, F., Xu, G., dan Song, A. (2012). A real explosion: The requirement of steam explosion pretreatment. *Bioresource Technology*, 121, 335–341. doi:10.1016/j.biortech.2012.06.055
- Zhang, L.G., C. Zhang, L.J. Ni, Y.J. Yang dan C.M. Wang, 2011. Rectification extraction of chinese herbs’ volatile oils and comparison with conventional steam distillation. *Sep. Purif. Technol.*, 77: 261-268