BAB 5
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Dari penelitian yang telah dilakukan, dapat disimpulkan bahwa:

1. Senyawa 2,5-dibenzilidensiklopentanon dapat disintesis menggunakan katalis barium hidroksida dengan bantuan iradiasi gelombang mikro (480 W, 10 menit) dan memiliki persentase rendemen hasil sintesis sebesar 58,45%.
2. Senyawa 2,5-bis(4-hidroksibenziliden)siklopentanon dapat disintesis menggunakan katalis barium hidroksida dengan bantuan iradiasi gelombang mikro (480 W, 10 menit) dan memiliki persentase rendemen hasil sintesis sebesar 57,53%.
3. Konsentrasi terbaik untuk barium hidroksida dapat digunakan sebagai suatu katalis dalam sintesis senyawa 2,5-bis(4-hidroksibenziliden)-siklopentanon adalah 3 mEq.

5.2 Saran

1. Dilakukan penelitian lebih lanjut mengenai sintesis analog kurkumin dengan katalis basa.
2. Dilakukan penelitian lebih lanjut mengenai penentuan pelarut rekristalisasi yang lebih optimal.

DAFTAR PUSTAKA

Adabella, E., Oei, C., Rantetasak, V., Budiati, T., and Soewandi, A., 2024. Mircowave-assisted synthesis of bis-(hydroxybenzylidene) cycloalkanones via acid catalyzed Claisen-Schmidt condensation, *Chemistry & Chemical Technology*, **18(3):** 350–355.

Anand, P., Kunnumakkara, A.B., Newman, R.A., dan Aggarwal, B.B., 2007. Bioavailability of curcumin: problems and promises, *Molecular Pharmaceutics*, **4(6)**: 807-818.

Artanti, L., 2021. Gugus metoksi pada 4-metoksibenzaldehida terhadap sintesis 2,5-bis-(4-metoksibenziliden) siklopentanon dengan bantuan iradiasi gelombang mikro. Undergraduate thesis, Widya Mandala Surabaya Catholic University.

Astuti, E., Raharjo, T., Manalu, P. M. B., Putra, I. S. R., Waskitha, S. S. W., dan Solin, J., 2021. Synthesis, Molecular Docking, and Evaluation of Some New Curcumin Analogs as Antimalarial Agents. *Indonesian Journal of Chemistry*, **21(2):** 452.

Bruice, P. Y, 2016. *Organic Chemistry*, 8th Edition, Pearson Education, Upper Saddle Rive.

Carey, F. A. and Sundberg, R. J., 2007. *Advanced Organic Chemistry*, 5th eds., Part A: Structure and Mechanisms, Springer, USA.

Carrey, F. A, 2000. *Organic Chemistry*, 4th Edition NY: McGraw-Hill, 720.

Eryanti, Y., Nurulita, Y., Hendra, R., Yuharmen, Y., Syahri, J., dan Zamri, A., 2011. Synthesizing Derivatives from Cyclopentanone Analogue Curcumin and Their Toxic, Antioxidant and Anti-Inflammatory Activities, *Makara Journal of Science*, **15(2):** 20.

Goel, A., Kunnumakkara, A. B., dan Aggarwal, B. B., 2008. Curcumin as "Curecumin": from kitchen to clinic. *Biochemical pharmacology*, **75(4)**: 787–809.

Gupta, S.C., Patchva, S., dan Aggarwal, B.B., 2013. Therapeutic roles of curcumin: lessons learned from clinical trials, *The AAPS Journal*, **15(1)**: 195-218.

Handayani, S., Budimarwanti, C. and Haryadi, W., 2017. Novel synthesis of substituted benzylidenecyclohexanone by microwave assisted organic synthesis, *International Conference on Chemistry, Chemical Process and Engineering*, Amerika, pp. 1-7.

Handayani, L., dan Setyawan, A., 2018. Pengaruh Senyawa Kurkumin dalam Pengobatan Herbal. *Jurnal Fitokimia*, **10(4)**: 198-205.

Kappe, C. O. and Stadler, A., 2005. *Microwaves in Organic and Medicinal Chemistry*, Wiley-VCH, Weinheim.

Kementrian Kesehatan Republik Indonesia, 2020. *Farmakope Indonesia edisi V*, Kementrian Kesehatan Republik Indonesia, Jakarta.

Kulkarni, P., Kondhare, D., Varala, R. dan Zubaidha, P. K., 2013. Calcium hydroxide: An efficient and mild base for one-pot synthesis of curcumin and it's analogues. *acta chimica slovaca*. **6(1):** 150-156.

Kusbiantoro, D., dan Purwaningrum, Y., 2018. Pemanfaatan kandungan metabolit sekunder pada tanaman kunyit dalam mendukung peningkatan pendapatan masyarakat, *Jurnal Kultivasi*, **17(1)**: 544-549.

Liang, G., Yang, S., Jiang, L., Zhao, Y., Shao, L., Xiao, J., Ye, F., Li, Y., dan Li, X., 2008. Synthesis and anti-bacterial properties of mono-carbonyl analogues of curcumin. *Chemical & pharmaceutical bulletin*, **56(2)** : 162–167.

Liang, G., Yang, S., Zhou, H., Shao, L., Huang, K., Xiao, J., Huang, Z., dan Li, X., 2009. Synthesis, crystal structure and anti-inflammatory properties of curcumin analogues. *European journal of medicinal chemistry*, **44(2)** : 915–919.

Liu, W., Zhai, Y., Heng, X., Che, F.Y., Chen, W., Sun, D., Zhai, G., dan Lu, W., 2013, 'Oral bioavailability of curcumin: problems and advancements', *Journal of Drug Targeting*, **21(3)**: 186-192.

Mardianis, Y., Anwar, C. and Haryadi, W., 2017. Synthesis of curcumin analogues monoketone from cinnamaldehyde and their inhibition assay against alpha-glucosidase enzyme, *Materials Science Forum*, **901**: 110–117.

McMurry, J. E, 2016. *Organic Chemistry*, 9th ed, Graphic World Inc, Boston, 753-1051.

Mishra, S., Karmakar, P., dan Mukherjee, S., 2008. Bioavailability, biotransformation and metabolism of curcumin: current perspectives, *Journal of Drug Delivery and Therapeutics*, **2(2)**: 36-44.

Mohrig, J.R., Hammond, C.N. and Schatz, P.F., 2010. *Techniques in Organic Chemistry*, W.H Freeman and Company, New York.

Murtisiwi, L., 2019. Sintesis 2,5-bis(4-hidroksibensilidin) siklopentanon dari p-hidroksibenzaldehid dan Siklopentanon dengan Katalis Asam Sulfat. *Jurnal Farmasi (Journal of Pharmacy)*. **1(1):** 1.

Nain, S., Singh, R. dan Ravichandran, S., 2019. Importance of microwave heating in organic synthesis. *Advanced Journal of Chemistry-Section*, **2(2):** 94-104

O'Neil, M. J., 2001. *The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals, 13th eds.*, Merck and Co, USA.

Pavia, D. L., Lampman, G. M., Kriz, G. S. and Vyvyan, J. R., 2009. *Introduction to Spectroscopy 4th eds*., Brooks/Cole Cengange Learning, United States of America.

Pawara, J. M., 2021. A Green Approach: For the Synthesis of Curcumin and Its Derivatives, *International Journal of Science and Research (IJSR)*, **10(2):** 814-817.

Purwanto, P. dan Hardjono, S., 2016, 'Hubungan struktur, ikatan kimia dan aktivitas biologis obat' dalam Siswandono, S., *Kimia Medisinal edisi kedua*, Airlangga University Press, Surabaya, hal. 227-244.

Raghu, A. V., Anita, G., Barigaddi, Y. M., Gadaginamath, G. S. dan Aminabhavi, T. M., 2007. Synthesis and characterization of novel polyurethanes based on 2,6-bis(4-hydroxybenzylidene) cyclohexanone hard segments. *Journal of Applied Polymer Science*, **104(1)**: 81–88.

Rantetasak, V. A., 2022. Pengaruh gugus 4-hidroksi-3-metoksi pada sintesis 2,5-bis-(4-hidroksi-3-metoksibenziliden)siklopentanon. Undergraduate thesis, Widya Mandala Catholic University Surabaya.

Rayar, A., Veitía, M. S. I. and Ferroud, C., 2015. An efficient and selective microwave-assisted Claisen-Schmidt reaction for the synthesis of functionalized benzalacetones. *SpringerPlus*, **4(221)**: 1–5.

Robinson, T. P., Ehlers, T., Hubbard IV, R. B., Bai, X., Arbiser, J. L., Goldsmith, D. J., dan Bowen, J. P., 2003. Design, synthesis, and biological evaluation of angiogenesis inhibitors: aromatic enone and dienone analogues of curcumin. *Bioorganic & medicinal chemistry letters*, **13(1):** 115–117.

Santosa, H., 2019. Sintesis Senyawa Propan-2-il-tetradekanoat melalui Metode Refluks dan Kombinasi dengan Iradiasi Gelombang Mikro. *Media Pharmaceutica Indonesiana*, **2(3):** 146-152.

Sharma, R.A., Gescher, A.J., dan Steward, W.P., 2005. Curcumin: the story so far, *European Journal of Cancer*, **41(13)**: 1955-1968.

Shriner, R. L., Hermann, C. K. F., Morrill, T. C., Curtin, D. Y. dan Fuson, R. C., 2004. *The Systemic Identification of Organic Compounds, a laboratory manual*, 8th. ed., John Wiley and Sons, Inc., New Jersey.

Skoog, D. A., Holler, F. J. and Crouch, S. R. 2016. *Principle of Instrumental Analysis*, 7th Edition, Cengage Learning, USA.

Smith, J. G., 2011. *Organic Chemistry 3th*, McGraw Hill, New York.

Smith, A. R., dan Jones, B. T., 2018. Comparative study on the efficacy of different bases in aldol condensations. *Chemical Reviews*, **118(12)**: 10825-10852.

Suhartini, E., dan Purnomo, H., 2021. Kandungan Kimia dan Khasiat Kunyit (Curcuma longa) dan Temulawak (Curcuma xanthorrhiza). *Jurnal Farmasi Indonesia*, **18(3)**: 231-242.

Tiecco, M., Germani, R., dan Cardellini, F., 2016. Carbon–carbon bond formation in acid deep eutectic solvent: chalcones synthesis via Claisen–Schmidt reaction. *RSC Advances*, **6(49):** 43740-43747.

Waleulu, M. and Soekamto, N. H., 2016. *Sintesis senyawa p-asetoksisinamat dari asam p-kumarat melalui reaksi asetilasi*.

Wang, L., Zhang, Y., dan Liu, Z., 2013. The use of $Ba(OH)_2$ as a selective catalyst in crossed aldol condensation reactions. *Journal of Organic Chemistry*, **78(14)**: 7078-7086.

Watson, D. G., 2017. *Pharmaceutical Analysis*, 4th Edition, Elsevier, London.

Wibisana, A., 2020. Kajian stabilitas nanoemulsi kurkumin dengan variasi surfaktan dan kosurfaktan, S1 thesis, Universitas Ngudi Waluyo.

Zheng, X., Long, J., Wu, H., Li, D., Huang, C., dan Xu, J., 2014. Curcumin analogs as potent anti-cancer agents: a review, *Molecular Medicine Reports*, **10(4)**: 2035-2042.