

BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Peningkatan konsentrasi ekstrak etanol buah apel berpengaruh terhadap nilai SPF. Peningkatan variasi konsentrasi siklometikon antar formula berpengaruh pada hasil evaluasi sediaan yaitu nilai pH, nilai viskositas, daya sebar, daya lekat, daya tercucikan air, nilai SPF dan daya *water resistant*.

5.2 Saran

Pada penelitian selanjutnya disarankan untuk mengkombinasikan ekstrak etanol buah apel dengan bahan aktif tabir surya alam lain atau bahan aktif sintetis untuk meningkatkan nilai SPF sediaan.

DAFTAR PUSTAKA

- Adiwibowo, S. R. 2012, Optimasi Kombinasi Trietanolamin dan Asam Stearat Terhadap Efektivitas Repelan Losio Ekstrak N-Heksena Batang Kemangi (*Ocimum sanctum Linn.*) Menggunakan Metode Simplex Lattice Design. *Skripsi*. Sarjana Farmasi. Universitas Tanjungpura. Pontianak.
- Angerer, J., Bernauer, U., Chambers, C., Chaudhry, Q., Degen, G., Eisenbrand, G., Platzek, T., Rastogi, S.C., Rogiers, V., Rousselle, C., Sanner, T., Savolainen, K., Engelen, J. V., Vinardell, M. P., Waring, R., and White, I. R. 2010. *Opinion on cyclomethicone (D4 / D5)*. Directorate General for Health and Consumers. European Union.
- Anggraini, D., Malik, M., dan Susiladewi, M. 2011. Formulasi Krim Serbuk Getah Buah Pepaya (*Carica papaya L.*) Sebagai Anti Jerawat. *Jurnal Fakultas Farmasi Universitas Andalas*. Riau.
- Anonim. 1986, *Channel Partner Mascot Engineering Company*, New Dehli
- Anonim. 2015, <http://www.greenwellness.my/>. Diakses pada tanggal 20 Juni 2015
- Anonim. 2015. Dermatology review. Diakses pada 20 Agustus 2015, <http://www.thedermreview.com/cyclomethicone/>
- Anonim. 2015. Konsentrasi Siklometikon. www.lotioncafter.com. Diakses pada tanggal 12 Juli 2015.
- Ansel, 1985, *Pengantar Bentuk Sediaan Farmasi*, ed. 4, Diterjemahkan dari Bahasa Inggris oleh F. Ibrahim, Universitas Indonesia Press, Jakarta, 353, 515.
- Aoyama, S., and Yamamoto, Y. 2007. *Antioxidant activity and flavonoid content of Welsh onion (*Allium fistulosum*) and the effect of thermal treatment*. Food Science and Technology Research, 13, 67–72.

- Ash, M and Ash, I. 2004. *Handbook of Preservatives*. Synapse Information Resources. USA. Halaman 347.
- Aswal, A., Kalra,M., and Rout, A., 2013, Preparation and evaluation of polyherbal cosmetic cream, *Der Pharmacia Lettre*, **5** (1): 83-88.
- Bomberdelli, E. 1991. Technologies for the processing of medicinal plants. In R.O.B. Wijesekera (ed).*The medicinal plant industry*. Florida: C R C Press Inc.
- Boyer, J and Liu, R. H. 2004. *Apple phytochemicals and their health benefits*. Nutrition Journal. BioMed Central. Cornell University, Ithaca, New York.
- Brown, M., and Fardell, N. 2000. Sun Damage and Sunscreen Preparations. In: H. Butler. *Poucher's Perfumes, Cosmetics, and Soaps*. Kluwer Academic Publishers, London.
- Buhse, L. 2003. *Presented at The Advisory Comitte dor Pharmaceutical Science Meeting*. <http://www.fda.gov/> diakses pada tanggal 11 Juli 2015.
- Cameo. 1992. NTP. <http://cameochemicals.noaa.gov/>. Diakses pada tanggal 11 Juli 2015.
- Casagrande, R., Georgetti, S. R., Verri, W. A., Jabor, J. R., Santos, A.C., dan Fonseca, M. J. V. 2006. *Evaluation of Functional Stability of Quercetin as a Raw Material and in Different Topical Formulations by its Antilipoperoxidative Activity*. AAPS PharmSciTech. **7** (1) Article 10.
- Caswell, M. 2011. Sunscreen formulation and testing. *Allured's cosmetics and toiletries magazine*, **116**: No. 9
- Cempaka, A. R., Santoso, S., dan Tanuwijaya, L. K. 2014, *Pengaruh Metode Pengolahan (Juicing dan Blending) Terhadap Kandungan Quercetin Berbagai Varietas Apel Lokal dan Impor (Malus Domestica)*, Indonesian Journal of Human Nutrition, **1**: 14-22
- Chairman, W. F., Bergfeld, M.D., Donald, V., Belsito, M.D., Ronald, A., Hill., Curtis, D., Klaassen., Daniel, C., Liebler., James, G. M., Ronald,

- C., Shank., Thomas, J. S., and Paul, W. 2009. *Safety Assessment of Cyclomethicone, Cyclotetrasiloxane, Cyclopentasiloxane, Cyclohexasiloxane, and Cycloheptasiloxane*. Cosmetic Ingredient Review. Washington.
- Clark, J. 2007. Thin layer chromatography. <http://www.chemguide.co.uk/>. diakses pada tanggal 3 September 2015
- Dalimarta, S., dan Adrian, F. 2014. Fakta Ilmiah Buah Sayur. Penebar Plus. Jakarta
- Darwin, P. 2013. Menikmati Gula Tanpa Rasa Takut. Perpustakaan Nasional: Sinar Ilmu.
- Departemen Kesehatan RI. 1982. Formularium Kosmetika Indonesia. Jakarta.
- Departemen Kesehatan RI. 1985. *Cara Pembuatan Simplisia*, Departemen Kesehatan Republik Indonesia. Direktorat Jenderal POM. Jakarta. 34-36, 399-429.
- Departemen Kesehatan RI. 1995. *Farmakope Indonesia edisi IV*, Departemen Kesehatan Republik Indonesia. Jakarta.
- Dermatix, U. 2015. *Fungsi Kulit Manusia*. <http://www.dermatixultra.org/fungsikulitmanusia/> diakses pada tanggal 28 Agustus 2015.
- Dewan Standarisasi Nasional, 1996, *Sediaan Tabir Surya*, Jakarta: SNI.
- Direktorat Jendral Pengawasan Obat dan Makanan Republik Indonesia (Dirjen POM RI). 2000. *Parameter Standar Umum Ekstrak Tumbuhan Obat*. Departemen Kesehatan Republik Indonesia. Jakarta.
- Draelos, Z. D. 2006. Cutaneous Formulation Issues. In: Z. D. Draelos and L. A. Thaman (Eds). *Cosmetic Formulation of Skin Care Product*. Taylor and Francis Group, New York.
- Epstein, J. H., and Wang, Q.C. 2015. Understanding UVA and UVB. The Skin Cancer Foundation. New York.

- FDA. 2013. Consumer Health Infoemation U.S Food and Drug Administration. Diakses pada 10 Agustus 2015. www.fda.gov.consumer.FDA
- Feist, P. 2010. TLC - Retention Factor (Rf). <http://orgchem.colorado.edu/>. diakses pada tanggal 3 September 2015
- Friedman, M. 1996. Food browning and its prevention: an overview. *Journal of Agricultural and Food Chemistry*, 44, 631–653.
- Garg, A., Aggarwal, D., Garg, S., and Siglal, A. K. 2002. *Spereading of Semisolid Formulation: An Update*. Pharmaceutical Technology.
- Gozali, D., Abdassah, M., Subghan, A., danAl-Lathiefah, S. 2009. Formulasi Krim Pelembab Wajah yang Mengandung Tabir Surya Nanopartikel Zink Oksida Salut Silikon. *Bandung Farmaka*, 7(1): 37-46.
- Gozali, D., Rusmiati, D., dan Utama, P., 2009, Formulasi dan uji stabilitas mikroemulsi ketokonazol sebagai antijamur *Candida albicans* dan *Tricophyton mentagrophytes*, *Farmaka*, 7 (2), 58.
- Handayani, P. 2011. Optimasi Komposisi Cetyl Alcohol Sebagai Emulsifying Agent dan Gliserin Sebagai Humectant Dalam Krim Sunscreen Ekstrak Kental Apel Merah (*Pyrus malus L.*) Aplikasi Design Faktorial. *Skripsi Fakultas Farmasi Universitas Sanata Dharma. Skripsi*. Fakultas Farmasi. Universitas Sanata Dharma. Yogyakarta.
- Hanson, K. and Bardeen C. 2011. Antioxidant in Sunscreens for Improved ROS Protection, Article of Cosmetics & Toiletries, Vol. 126 Issue 10, pp. 710-717.
- Hapsari, M.D. Y., dan Estiasih, T. 2015. Variasi Proses dan Grade Apel (*Malus sylvestris mill*) Pada Pengolahan Minuman Sari Buah ApelPADA *PENGOLAHAN MINUMAN SARI BUAH APEL: KAJIAN PUSTAKA*. FTP Universitas Brawijaya Malang. Jurnal Pangan dan Agroindustri Vol. 3 No 3 p.939-949.
- Haryanto, Y. 2013. Kamus Pertanian Umum. Penebar Swadaya. Jakarta.

- Hassan, I., Konchok D., Abdul S., and Parvaiz A. 2013. Sunscreens and Antioxidants as Photo-Protective Measure: An Update, Our Dermatol Online, Vol. 4, No. 3, pp. 369- 374
- Hayes, A. W., Thomas, J. A., and Gardner, D.E. 2001. Toxicology of Skin. Taylor and Francis. USA. Philadelphia.
- Heinrich, M., Barnes, J., Gibbons, S., dan Williamson, E.M., 2010, *Farmakognosi dan Fitoterapi*, EGC, Jakarta.
- Houben, R., and Lem, T.K. 2014. Selecting the perfect silicone for your formulation.. www.brbb-international.com/. Diakses pada 10 Agustus 2015.
- Jones, D. S. 2010. *Statistik Farmasi*. ECG. Jakarta. Halaman 55.
- Kanegsberg, B and Kanegsberg, E. 2011. *Handbook for Critical Cleaning: Cleaning agents and systems*. CRC. Halaman 19. ISBN 978-1-4398-2827-4.
- Kapoor, S., and Saraf, S. Efficacy study of sunscreen containing various herbs for protecting skin from UVA and UVB sunrays. *Pharmacognosy Magazine*. 2009; (5):238-248.
- Kelly, G. S. 2011. Quercetin. Volume 16, Number 2 Alternative Medicine Review
- Khadeem, E. J. 2007, Identification of Quercetin in Echinops Tenuisectus Family Compositae, *American Journal of Plant Sciences (AJPS)*, (4)1
- Kulkarni, Snehal.S, Bhalke, Rasika. D, Pande, Vishal.V, Kendre, and Prakash.N. 2014, *Herbal Plants in Photo Protection and Sun Screening Action: an Overview*, Indo American Journal of Pharmaceutical Research, 4:2231-6867
- Lachman, L., Lieberman H. A. dan Kanig, J. L. 1994. *Teori dan Praktek Farmasi Industri*. Edisi 2. (S. Suyatni, penerjemah). UI Press, Jakarta.
- Lipsy, P. 2010. *Thin Layer Chromatography Characterization of the Active Ingredients in Excedrin and Anacin*. USA: Department of Chemistry and Chemical Biology, Stevens Institute of Technology.

- Lowe, N. J., and Shaath, N. A. 1990. *Sunscreens: Development, Evaluation, and Regulatory Aspects*. Marcel Dekker INC. New York.
- Mansur, J. S., Breder, M. N. R., Mansur, M. C. A., and Azulay, R. D. 1986. Determinacao do fator de protecao solar por espectrofotometria. *An. Bras. Dermatol.*, Rio de Janeiro, v. 61, p. 121-124.
- Mishra, A. K., Mishra, A., and Chattopadhyay, P. 2011. Herbal Cosmeceuticals for Photoprotection from Ultraviolet B Radiation: A Review, *Tropical Journal Of Pharmaceutical Research*. **10**(3), p351.
- Mitsui, T. 1997. *New Cosmetics Science*. Elsevier Science B. V. Amsterdam.
- Mutaya, I. N. 2012. Penentuan Efektifitas dan Konsentrasi Efektif Oktil Dimetil PABA sebagai Tabir Surya. *Skripsi*. Universitas Airlangga. Surabaya
- Nath, A., Raghunatha, P., and Joshi, S. 2012. Biological Activities of Endophytic fungi of *Embllica officinalis*, an Ethnomedicinal Plant of India. *Microbiology*. 40(1):8-13.
- Neema R, Singh R, and Dubey B. Introduction and classification. Text book of cosmetics, CBS Publication and distributors 2009; (1): 82-87.
- Nurhayat, W. 2015. Detikfinance.. <http://finance.detik.com/>. Diakses pada 08 Agustus 2015
- Paithankar, V.V., 2010, Formulation and Evaluation of Herbal Cosmetic Preparation using Safed Musli, *International Journal of Phamtech Research*, **2 (4)**: 2261-2264.
- Panda, H., 2000, *Herbal Cosmetics Handbook*, Asia Pacific Business Press Inc., Delhi, 41, 74.
- Patmarani, A. 2007. Aplikasi Minyak Jahe (*Zingiber officinale*) pada Pembuatan Hand and Body Cream, *Sripsi Fakultas Teknologi Pertanian Institut Pertanian Bogor*. Bogor.

- Pienciak, E. 2009. Microbial Infection of Burn Wounds MicrobeWiki. <http://www.nlm.nih.gov/MEDLINEPLUS/>. diakses pada tanggal 10 Juli 2015.
- Puspita, S., 2015. *Merawat Kulit Wajah Tidak Bermasalah*. Program Keahlian tata Kecantikan Kulit.
- Reuters, T. 1991. Final Report on the Safety Assessment of Cyclomethicone. *International Journal of Toxicology*. **10(1):9-19**.
- Roth, J. H., dan Blaschke, G., 1998. *Analisis Farmasi*. Doterjemahkan dari Bahasa Inggris oleh Kisman, dkk. UGM Press. Yogyakarta.
- Rowe, R. C., Sheskey, P. J., and Quinn, M. E. 2009. *Handbook of Pharmaceutical Excipients 6th Edition*. Pharmaceutical Press and The American Pharmacist Association, London.
- Salamone, J. C. 1996. *Polymeric Materials Encyclopedia. Library of Congress Cataloging Volume 5*. Halaman 2907.
- Sapers, G.M. 1993. Browning of foods: control by sulfites, antioxidants and other means. *Food Technology*, 47(10), 75–84.
- Sayre, L.M., and Nadkarni, D.V. 1994. Direct conversion of phenols to o-quinones by copper(I)dioxygen. Questions regarding the monophenolase activity of tyrosinase mimics, *J. Am. Chem. Soc.*, 116, **1994**, 3157-3158
- Sayre, R. M., Agin, P. P., Levee, G. J., and Marlowe, E. 1979. Comparison of *in* and *in vitro* testing of sunscreening formulas. *Photochem. Photobiol.*, Oxford, v.29, p. 559-566.
- Sharma, PP. 2008. Cosmetics Formulation Manufacturing Quality Control. Vandana Publication. 4:189-191.
- Singh, M., Sharma, S., Khokra, S.L., Sahu, R.K., Jangde, R., 2011, Preparation and evaluation of herbal cosmetic cream, *Pharmacologyonline*, **2**: 1258-1264.

- Skoog, D. A., West, D.M., and Holler, F. J. 1996. *Fundamentals of Analytical Chemistry*. 7th edition. New York: Saunders College Publishing. Hal. 17-25.
- SNI. 1996. *Sediaan Tabor Surya, Dewan Standarisasi Nasional*. Jakarta.
- Sufrida, Y., Irlansyah, E.J., dan Mufatis, W. 2013. Khasiat dan Manfaat Apel. Agromedia. Jakarta.
- Svobodova, A., Psotova, J., and Walterova D. 2003. Natural phenolics in the prevention of UV-induced skin damage. *Biomed. Pap. Med. Fac. Univ. Palacky Olomouc Czech. Repub.* **147**, 137-145.
- Swastika, A., Mufrod., dan Purwanto. 2013. Aktivitas antioksidan krim ekstrak sari tomat (*Solanum lycopersicum L.*). *Traditional Medicine Journal*, **18(3): 132-140**.
- Tranggono, R. I. S., dan Latifah, F. 2007, *Buku Pegangan Ilmu Pengetahuan Kosmetik*, Gramedia Pustaka Umum, Jakarta.
- Utami, P. 2008. Buku Pintar Tanaman Obat. Agro Media. Jakarta Selatan.
- Valero, E., Varon, R., and Garcia-Carmona, F. 1991. A kinetic study of irreversible enzyme inhibition by an inhibitor that is rendered unstable by enzymic catalysis. *Biochemistry Journal*, 277, 869–874.
- Voigt, R. 1994. *Buku Pelajaran Teknologi Farmasi Edisi 5*. (S.N. Soewandhi, penerjemah). Universitas Gadjah Mada Press. Yogyakarta.
- Wasitaatmadja, S. M. 1997. *Penuntun Ilmu Kosmetik Medik*. UI press. Jakarta.
- Wilkinson, J. B. and R.J. Moore. 1982. *Harry's Cosmeticology 7th edition*. George Godwin, London:226
- Wilson, K.L., dan Berendsohn, W. G. (eds) (2013). IOPI Global Plant Checklist (version 10.0, Aug 2007). In: Species 2000 & ITIS Catalogue of Life, 11th March 2013 (Roskov Y., Kunze T., Paglinawan L., Orrell T., Nicolson D., Culham A., Bailly N., Kirk P., Bourgoin T., Baillargeon G., Hernandez F., and De

Wever A., eds). Digital resource at www.catalogueoflife.org/col/. Species 2000: diakses pada tanggal 27 Agustus 2015.

Wiryowidagdo, S., dan Sitanggang, M. 2002. Tanaman Obat untuk Penyakit Jantung, Darah Tinggi, dan Kolesterol. Agromedia Pustaka. Jakarta Selatan.

World Health Organization, 2006, *The International Pharmacopeia*, 4th ed., vol. 1, Singapore, 969-971.

Youn, B., and Yang, H.J. 2011. Chemoprevention of Skin Cancer with Dietary Phytochemicals. Yaguang Xi. <http://www.intechopen.com/books/>. Diakses pada tanggal 10 Juli 2016.