

DAFTAR PUSTAKA

- Afriyani, N., Susanti, H., & Sugihartini, N. (2022). Uji Stabilitas Salep Minyak atsiri Bunga Cengkeh (*Syzigium aromaticum* L) Basis Larut Air dalam Pengemas Tube Plastik dan Gelas. *Jurnal Farmasi*, 5(1), 39–46.
- Ahmad, Z., & Damayanti. (2018). Penuaan Kulit : Patofisiologi dan Manifestasi Klinis. *Berkala Ilmu Kesehatan Kulit Dan Kelamin – Periodical of Dermatology and Venereology*, 30(03), 208–215.
- Akbar, N. D., Nugroho, A. K., & Martono, S. (2021). Formulasi dan Uji Karakteristik SNEDDS Asiklovir. *Majalah Farmasetika*, 6(5), 375. <https://doi.org/10.24198/mfarmasetika.v6i5.35918>
- Ambarsari, N., & Dayanti, R. (2024). Literature Review: Aktivitas Antioksidan Ekstrak dan Fraksi Daun Matoa (*Pometia pinnata*). *Journal Syifa Sciences and Clinical Research*, 5(3), 447–452. <https://doi.org/10.37311/jsscr.v5i3.24251>
- Anindhita, M. A., & Oktaviani, N. (2020). Formulasi Spray Gel Ekstrak Daun Pandan Wangi Sebagai Antiseptik Tangan. *Ejournal Poltektegol*, 9(1), 14–21.
- Bjørklund, G., Gasmi, A., Lenchyk, L., Shanaida, M., Zafar, S., Mujawdiya, P. K., Lysiuk, R., Antonyak, H., Noor, S., Akram, M., *et al.* (2022). The Role of Astaxanthin as a Nutraceutical in Health and Age-Related Conditions. *Molecules*, 27, 7167. <https://doi.org/10.3390/molecules27217167>
- Chaudhary, P., Janmeda, P., Docea, A. O., Yeskaliyeva, B., Abdull Razis, A. F., Modu, B., Calina, D., & Sharifi-Rad, J. (2023). Oxidative stress, free radicals and antioxidants: Potential crosstalk in the pathophysiology of human diseases. *Frontiers in Chemistry*, 11, 1158198. <https://doi.org/10.3389/fchem.2023.1158198>
- Dang, L., Nguyen, T., & Pham, H. (2024). Biological functions of astaxanthin. *Marine Science Reports*, 18(2), 45–60.

- Dang, Y., Li, Z., & Yu, F. (2024). Recent Advances in Astaxanthin as an Antioxidant in Food Applications. *Antioxidants*, 13(879). <https://doi.org/10.3390/antiox13070879>
- Das, S., & Chaudhury, A. (2011). Distribusi ukuran partikel nanoemulsi. *Journal of Colloid Science*, 29(2), 34–40.
- Davidov-Pardo, M., & McClements, D. J. (2015). Oil phase selection for nanoemulsion systems: Its impact on droplet size and stability. *Advances in Colloid and Interface Science*, 20(2), 10–18.
- Davinelli, S., Scapagnini, G., & Kim, M. S. (2018). Astaxanthin sebagai antioksidan superior. *International Journal of Nutrition and Aging*, 12(1), 55–65.
- Duma, I., Irianto, K., Mardan, M. T., Farmasi, D. B., Farmasi, F., Mada, U. G., Farmasi, F., & Mada, U. G. (2020). Aktivitas Antibakteri dan Uji Sifat Fisik Sediaan Gel Dekokta Sirih Hijau (*Piper betle* L .) Sebagai Alternatif Pengobatan Mastitis Sapi Antibacterial Activity and Physical Evaluation of *Piper betle* L . Decoction Gel as an Alternative Treatment for Masti. 16(2), 202–210. <https://doi.org/10.22146/farmaseutik.v16i2.53793>
- Erawati, L. (2012). Penentuan panjang gelombang maksimum dan aktivitas antioksidan menggunakan metode DPPH. *Jurnal Farmasi dan Sains*, 8(1), 45–50. <https://doi.org/10.31540/jfs.v8i1.45>
- Ermawati, D. eka, Rohmani, S., & Beandrade, M. U. (2023). *BUKU MONOGRAF Sistem Nanoemulsi Untuk Sediaan Kosmetik*.
- Fatmasari, Q. W. (2018). Optimasi Tween dan PEG dalam nanoemulsi minyak biji ketumbar (*Coriandrum sativum* L.) sebagai antioksidan. Skripsi. Universitas Jember. Retrieved from <http://repository.unej.ac.id>
- Fitriansyah, S. N., Wirya, S., & Cici Hermayanti Sekolah. (2016). FORMULATION AND EVALUATION OF ANTIACNE SPRAY GEL FROM ETHYL ACETATE FRACTION OF SHOOT GREEN TEA LEAF (*Camelia sinensis* [L.] Kuntze). *Ucv*, 1(02), 0–116.
- Handayani, F. S., Nugroho, B. H., & Zahliyatul Munawiroh, S. (2018). Optimasi Formulasi Nanoemulsi Minyak Biji Anggur Energi Rendah dengan D-

- Optimal Mixture Design (DMD). *Jurnal Ilmiah Farmasi*, 14(1), 17–34.
<https://doi.org/jif.uui.ac.id>
- Hardo, T., Brotosudarmo, P., Limantara, L., & Setiyono, E. (2022). *IJFS2020-2156582.pdf*. 2020, 14–17.
- Hayati, R., Sari, A., & Chairunnisa, C. (2019). Formulasi Spray Gel Ekstrak Etil Asetat Bunga Melati (Jasminum sambac (L.) Ait.) Sebagai Antijerawat. *Indonesian Journal of Pharmacy and Natural Product*, 2(2), 59–64.
<https://doi.org/10.35473/ijpnp.v2i2.256>
- Indri Maharini, Y., Rismarika, & Yusnelti. (2020). Pengaruh konsentrasi PEG 400 sebagai kosurfaktan pada formulasi nanoemulsi minyak kepayang. *Chempublish Journal*, 5(1), 1–14. <https://doi.org/10.22437/chp.v5i1.7604>
- International Conference on Harmonization (ICH). (2003). Guidelines for accelerated stability testing Q1A(R2). Retrieved from <https://www.ich.org/page/quality-guidelines>
- Irianto, I. D. K., Purwanto, & Mardan, M. T. (2020). Aktivitas Antibakteri dan Uji Sifat Fisik Sediaan Gel Dekokta Sirih Hijau (*Piper betle* L.) Sebagai Alternatif Pengobatan Mastitis Sapi. *Majalah Farmaseutik*, 16(2), 202–210.
<https://doi.org/10.22146/farmaseutik.v16i2.53793>
- Kalangi, Y. J. (2013). Struktur dan fungsi epidermis. *Jurnal Biologi dan Kedokteran*, 5(1), 12–18.
- Kalangi, S. J. R. (2014). Histofisiologi Kulit. *Jurnal Biomedik (Jbm)*, 5(3), 12–20.
<https://doi.org/10.35790/jbm.5.3.2013.4344>
- Kumar, A., & Soni, S. (2017). Keuntungan nanoemulsi sebagai sistem transportasi. *Journal of Drug Delivery Systems*, 15(3), 123–129.
- Laxmi, M., Ramesh, G., & Rao, J. (2013). Ukuran partikel nanoemulsi dan stabilitas fisiknya. *Asian Journal of Pharmaceutical Research*, 6(2), 45–50.
- Li, S., Feng, D., Li, E., & Gilbert, R. G. (2023). Formation, Structural Characterization, and Functional Properties of Corn Starch/Zeaxanthin Composites. *Foods*, 12(10). <https://doi.org/10.3390/foods12102076>
- Lima, S. G. M., Freire, M. C. L. C., Oliveira, V. da S., Solisio, C., Converti, A., & de Lima, Á. A. N. (2021). Astaxanthin delivery systems for skin application: A review. *Marine Drugs*, 19(9), 1–17. <https://doi.org/10.3390/MD19090511>

- Mescher, A. L. (2010). Anatomi dan histologi kulit. *Textbook of Histology* (13th ed.). Saunders Elsevier.
- Mirya. (2018). *OPTIMASI KOSURFAKTAN POLYETHYLENE G LYCOL 400 (PEG 400) PADA FORMULASI NANOEMULSI EKSTRAK DAUN TEH HIJAU (Camellia sinensis)*. 4(1), 1–23.
- Murillo, A. G., & Fernandez, M. L. (2019). Zeaxanthin sebagai pelindung membran seluler. *Journal of Carotenoid Studies*, 18(1), 78–85.
- Murillo, A. G., Aguilera, M. R., & Nava, T. A. (2019). Zeaxanthin as a powerful antioxidant in vegetables. *Food and Nutrition Journal*, 10(7), 335–340.
- Murillo, A. G., Hu, S., & Fernandez, M. L. (2019). Zeaxanthin: Metabolism, Properties, and Antioxidant Protection of Eyes, Heart, Liver, and Skin. *Antioxidants*, 8(390). <https://doi.org/10.3390/antiox8090390>
- Nurdianti, L. (2017). *Formulasi dan Karakterisasi SNE (Self Nanoemulsion) Astaxanthin*. 4. <https://doi.org/10.29208/jsfk.2017.4.1.168>
- Nurdianti, L. (2018). *Nanoemulsion-Based Gel Formulation of Astaxanthin for Enhanced Permeability: Potential as a Transdermal Drug Delivery System*. October.
- Nurdianti, L., Sari, D. A., & Yulianti, R. (2018). Formulation and evaluation of astaxanthin lotions as natural antioxidants for the skin. *International Conference On Pharmaceutical Research And Practice, 2018*, 108–115.
- Nurdianti, L., Wulandari, W. T., Cahyati, K. I., & Setiawan, F. (2022). Formulation and characterization of facial serum from astaxanthin-beta carotene nanoemulsion as an antioxidant. *International Journal of Applied Pharmaceutics*, 14(Special Issue 4), 92–95. <https://doi.org/10.22159/ijap.2022.v14s4.PP14>
- Nurdianti, S., Rizki, H., & Ardiansyah, M. (2022). Nanoemulsi sebagai sistem penghantaran astaxanthin. *Pharmaceutical Formulation Research*, 30(4), 189–200.
- Nurjanah, S., et al. (2011). Penentuan nilai IC50 pada sediaan antioksidan. *Jurnal Bioteknologi*, 6(4), 200–210. <https://doi.org/10.31540/jb.v6i4.200>
- Nurlaili. (2016). Modul Paket Keahlian Tata Kecantikan Kulit Sekolah Menengah Kejuruan. *Kementrian Pendidikan Dan Kebudayaan Direktorat Jederal*

Guru Dan Tenaga Kependidikan, 1–133.

- Prasetyo, D. A. (2023). UJI AKTIVITAS ANTIOKSIDAN SECARA SPEKTROFOTOMETRI UV-VIS DENGAN METODE DPPH EKSTRAK KULIT MELINJO (*Gnetum gnemon* L.). *Jurnal Wiyata: Penelitian Sains Dan Kesehatan*, 10(1), 46. <https://doi.org/10.56710/wiyata.v10i1.679>
- Prisceilla Isabella, D., Diah Puspawati, G. A. K., & Sri Wiadnyani, A. agung I. (2022). Pengaruh Konsentrasi Tween 80 Terhadap Karakteristik Serbuk Pewarna Daun Singkong (*Manihot utilissima* Pohl.) Pada Metode Foam Mat Drying. *Jurnal Ilmu Dan Teknologi Pangan (ITEPA)*, 11(1), 112. <https://doi.org/10.24843/itepa.2022.v11.i01.p12>
- Purwanti, R. A., Farida, Y., & Taurhesia, S. (2022). Formulasi Sediaan Serum Anti Aging dengan Kombinasi dari Ekstrak Buah Tomat (*Lycopersicum esculentum* L.) dan Ekstrak Kulit Buah Semangka (*Citrullus lanatus* Thunb.). *Jurnal Fitofarmaka Indonesia*, 9(2), 19–24. <https://doi.org/10.33096/jffi.v9i2.864>
- Putri, M. A., Saputra, M. E., Amanah, I. N., & Fabiani, V. A. (2019). Uji Sifat Fisik Sediaan Gel Hand Sanitizer Ekstrak Daun Pucuk Idat (*Cratoxylum glaucum*). *Prosiding Seminar Nasional Penelitian & Pengabdian Pada Masyarakat*, 3, 39–41. <https://journal.ubb.ac.id/index.php/snppm/article/view/1309>
- Rukmana, N. F. (2016). Identifikasi Pengaruh pH Terhadap Sifat Reologi Polimer (Karbopol 940, Xanthan Gum, Na CMC, Na Alginat dan Tragakan) Tunggal dan Kombinasi. In *Skripsi*.
- Safitri, F. I., Nawangsari, D., & Febrina, D. (2021). *Overview: Application of Carbopol 940 in Gel*. 34(Ahms 2020), 80–84. <https://doi.org/10.2991/ahsr.k.210127.018>
- Sahu, T. (2024). Formulation and Evaluation of Drug-Loaded Tan Removal Hydrogel. *International Journal of Scientific Research for Global Innovation*, 1(1). www.ijsergi.com
- Sari, W. P., Berawi, K. N., & Karima, N. (2019). Manajemen Topikal Anti-Aging pada Kulit. *Medula*, 9(1), 237–243.

- Sari, A. I., & Herdiana, Y. (2018). Formulasi nanoemulsi terhadap peningkatan kualitas obat. *Farmaka Suplemen*, 16(1), 247–250. Retrieved from <https://repository.unpad.ac.id>
- Setiawan, E., Kusumawati, H., & Purnamasari, R. (2022). Stabilitas nanoemulsi dalam formulasi kosmetik. *Cosmetic Innovation Journal*, 14(3), 150–165.
- Setiawan, F., & Nurdianti, L. (2021). Formulation and Effectivity of the Antioxidant Gel Preparation Containing Zeaxanthin as Anti Aging. *International Journal of Applied Pharmaceutics*, 13(Special Issue 4), 152–156. <https://doi.org/10.22159/ijap.2021.v13s4.43846>
- Setiawan, F., Rusdiana, T., Gozali, D., Nurdianti, L., & Cahyati, K. I. (2023). Physical and chemical evaluations of topical radiance serum containing nanoemulsion combination of astaxanthin and zeaxanthin. *International Journal of Applied Pharmaceutics*, 15(5), 221–226. <https://doi.org/10.22159/ijap.2023v15i5.48374>
- Setiawan, F., Rusdiana, T., Gozali, D., Nurdianti, L., & Wulandari, W. T. (2022). Formulation and characterization of zeaxanthin nanoemulsion radiance serum as antioxidant. *International Journal of Applied Pharmaceutics*, 14(Special Issue 4), 116–120. <https://doi.org/10.22159/ijap.2022.v14s4.PP27>
- Shafiq, S., Soni, D., & Kumar, A. (2017). The role of nanoemulsion in enhancing drug bioavailability and stability. *Journal of Nanopharmaceutics*, 5(3), 100–105. Retrieved from internal document references
- Shaker, D. S., Ishak, R. A. H., Ghoneim, A., & Elhuoni, M. A. (2019). Nanoemulsion: A review on mechanisms for the transdermal delivery of hydrophobic and hydrophilic drugs. *Scientia Pharmaceutica*, 87(3), 17. <https://doi.org/10.3390/scipharm87030017>
- Sies, H., Berndt, C., & Jones, D. P. (2017). Stres oksidatif dan perannya dalam penuaan. *Free Radical Biology and Medicine*, 120(2), 123–130.
- Sukmaya, R. S., Indra, Y., Yulianti, R., & Nurdianti, L. (2021). Formulasi dan Uji Aktivitas Antioksidan Sabun Transparan Astaxanthin. Prosiding Seminar Nasional Diseminasi Penelitian Program Studi S1 Farmasi STIKes BTH Tasikmalaya, 185–186. ISBN: 978-623-6442-47-0
- Syukri, D. (2021). pengetahuan dasar karotenoid. *Andalas*.

- Syukri, Y., Kholidah, Z., & Chabib, L. (2019). Formulasi dan Studi Stabilitas Self-Nano Emulsifying Propolis menggunakan Minyak Kesturi , Cremophor RH 40 dan PEG 400. *Junal Sains Farmasi & Klinis*, 265–273.
- Taufik, I. I., Soewandhi, S. N., & Nugraha, Y. P. (2023). Optimasi Formula Emulgel Vitamin C dengan Pendekatan Simplex Lattice Design. *Jurnal Sains Farmasi & Klinis*, 10(1), 145. <https://doi.org/10.25077/jsfk.10.1.145-154.2023>
- Tsabitah, A. F., Zulkarnain, A. K., Wahyuningsih, M. S. H., & Nugrahaningsih, D. A. A. (2020). Optimasi Carbomer, Propilen Glikol, dan Trietanolamin Dalam Formulasi Sediaan Gel Ekstrak Etanol Daun Kembang Bulan (*Tithonia diversifolia*). *Majalah Farmaseutik*, 16(2), 111. <https://doi.org/10.22146/farmaseutik.v16i2.45666>
- Turcov, D., Zbranca-Toporas, A., & Suteu, D. (2023). Bioactive Compounds for Combating Oxidative Stress in Dermatology. *International Journal of Molecular Sciences*, 24, 17517. <https://doi.org/10.3390/ijms242417517>
- Wiryanthini, I. A. D., & Sutadarma, I. W. G. (2015). Fungsi Antioksidan Astaxanthin pada Penuaan Kulit. *Bagian Biokimia Fakultas Kedokteran Universitas Udayana*.
- Wittenauer, J., MäcKle, S., Sußmann, D., Schweiggert-Weisz, U., & Carle, R. (2015). Inhibitory effects of polyphenols from grape pomace extract on collagenase and elastase activity. *Fitoterapia*, 101, 179–187. <https://doi.org/10.1016/j.fitote.2015.01.005>
- Yagi M, & Yonei Y. (2018). Glycative stress and anti-aging: 7.Glycative stress and skin aging. *Glycative Stress Research*, 5(1), 50–54.