

DAFTAR PUSTAKA

- Abooshahab, R., Hooshmand, K., Razavi, S. A., Gholami, M., Sanoie, M., & Hedayati, M. (2020). Plasma Metabolic Profiling of Human Thyroid Nodules by Gas Chromatography-Mass Spectrometry (GC-MS)-Based Untargeted Metabolomics. *Frontiers in Cell and Developmental Biology*, 8(1), 1–13. <https://doi.org/10.3389/fcell.2020.00385>
- Agaus, L. R., & Agaus, R. V. (2019). Manfaat Kesehatan Tanaman Pala (*Myristica fragrans*). *Medula*, 6(3), 662–666.
- Al-Jumaily, E. F., & Al-Amiry, M. H. A. (2012). Extraction and Purification of Terpenes from Nutmeg (*Myristica fragrans*). *Journal of Al-Nahrain University Science*, 15(3), 151–160. <https://doi.org/10.22401/jnus.15.3.21>.
- Andriansyah, I., Gumilar, H. F., Juanda, D., & Yuliantini, A. (2022). Analisis Sidik Jari Herba Pegagan (*Centella asiatica* (L.) Urb) di Daerah Jawa Barat Menggunakan Metode Spektrofotometri FTIR Dikombinasi dengan PCA. *Jurnal Agrotek Ummat*, 9(4), 287–297. <https://doi.org/10.31764/jau.v9i4.10949>.
- Arina, Y., Shiyan, S., & Suprayetno, S. (2022). Analisis Kemometrik Ekstrak Akar Tunjuk Langit (*Helminthostachys Zeylanica* (L) melalui Analisis Fourier Transformed Infrared dari Berbagai Daerah Sumatera Selatan. *Jurnal 'Aisyiyah Medika*, 7(1), 243–258. <https://doi.org/10.36729/jam.v7i1.790>.
- Astuti, R. (2019). Pengaruh Waktu Distilasi Minyak Biji Pala (*Myristica fragrans*) dengan Metode Distilasi Uap dan Identifikasi Komponen Kimiawi. *Indonesian Journal of Laboratory*, 1(2), 36–40. <https://doi.org/10.22146/ijl.v1i2.44741>.
- Azizan, N. I., Mokhtar, N. F. K., Arshad, S., Sharin, S. N., Mohamad, N., Mustafa, S., & Hashim, A. M. (2021). Detection of Lard Adulteration in Wheat Biscuits Using Chemometrics-Assisted GCMS and Random Forest. *Food Analytical Methods*, 14(11), 2276–2287. <https://doi.org/10.1007/s12161-021-02046-9>.
- Barea-Sepúlveda, M., Duarte, H., Aliaño-González, M. J., Romano, A., & Medronho, B. (2022). Total Ion Chromatogram and Total Ion Mass Spectrum as Alternative Tools for Detection and Discrimination (A Review). *Chemosensors*, 10(11), 1–18. <https://doi.org/10.3390/chemosensors10110465>.
- Berly, I., & Kapelle, D. (2023). Analysis of Essential Oils from Clove Flowers and Stems (*Syzygium aromaticum* L.) from Saparua Island, Maluku. *Teknotan*, 17(2), 131–136. <https://doi.org/10.24198/jt.vol17n2.7>.

- Blaženović, I., Kind, T., Ji, J., & Fiehn, O. (2018). Software Tools and Approaches for Compound Identification of LC-MS/MS Data in Metabolomics. *Metabolites*, 8(2), 1–23. <https://doi.org/10.3390/metabo8020031>.
- Cain, C. N., Schöneich, S., & Synovec, R. E. (2020). Development of An Enhanced Total Ion Current Chromatogram Algorithm to Improve Untargeted Peak Detection. *Analytical Chemistry*, 92(16), 11365–11373. <https://doi.org/10.1021/acs.analchem.0c02136>.
- Chanana, S., Thomas, C. S., Zhang, F., Rajski, S. R., & Bugni, T. S. (2020). HCAPCA: Automated Hierarchical Clustering and Principal Component Analysis of Large Metabolomic Datasets in R. *Metabolites*, 10(7), 1–15. <https://doi.org/10.3390/metabo10070297>.
- Chong, J., Wishart, D. S., & Xia, J. (2019). Using MetaboAnalyst 4.0 for Comprehensive and Integrative Metabolomics Data Analysis. *Current Protocols in Bioinformatics*, 68(1), 1–128. <https://doi.org/10.1002/cpbi.86>.
- Damayanti, R., Fahmi, C. N., & Efendi, R. (2015). Sifat Fisik Minyak Atsiri Daun Pala (*Myristica Fragrans* Houutt) Aceh Selatan. *BIOLINK (Jurnal Biologi Lingkungan Industri Kesehatan)*, 1(2), 76–80. <https://doi.org/10.31289/biolink.v1i2.727>.
- Dembélé, D., & Kastner, P. (2016). Comments on: Fold Change Rank Ordering Statistics: A New Method for Detecting Differentially Expressed Genes. *BMC Bioinformatics*, 17(1), 1–15. <https://doi.org/10.1186/s12859-016-1322-0>.
- Dupuy, N., Molinet, J., Mehl, F., Nanlohy, F., Le Dréau, Y., & Kister, J. (2013). Chemometric Analysis of Mid Infrared and Gas Chromatography Data of Indonesian Nutmeg Essential Oils. *Industrial Crops and Products*, 43(1), 596–601. <https://doi.org/10.1016/j.indcrop.2012.07.073>.
- Esteki, M., Shahsavari, Z., & Simal-Gandara, J. (2020). Gas Chromatographic Fingerprinting Coupled to Chemometrics for Food Authentication. *Food Reviews International*, 36(4), 384–427. <https://doi.org/10.1080/87559129.2019.1649691>.
- Frolova, N., Ukrainets, A., Niemirich, O., Melnyk, O., & Ustymenko, I. (2020). Efficiency of Gas Chromatographic Analysis of Terpens and Terpenoids of Sources of Aromatic Substances, Taking Into Account The Polarity of The Stationary Phase. *Ukrainian Food Journal*, 9(3), 664–676.
- García-Seval, V., Martínez-Alfaro, C., Saurina, J., Núñez, O., & Sentellas, S. (2022). Characterization, Classification and Authentication of Spanish Blossom and Honeydew Honeys by Non-Targeted HPLC-UV and Off-Line SPE HPLC-UV Polyphenolic Fingerprinting Strategies. *Foods*, 11(15), 1–20. <https://doi.org/10.3390/foods11152345>

- Hadi, S., Kamelia, S., Khairunnisa, A., & Salma. (2023). Autentikasi Batang *Combertum Indicum Varr. B* terhadap Batang *Varr. M* dengan Metode Spektrofotometri UV-Vis-Kemometrik. *Jurnal Ilmu Kefarmasian*, 4(1), 115–121.
- Halmahera, M. B. (2024). Autentikasi Minyak Atsiri Pala (*Myristiva fragrans* Houitt) Dengan Metode Fingerprinting Menggunakan High Performance Liquid Chromatography (HPLC) Kombinasi Kemometrik. 1(1), 1–82.
- Hidayati, N., Ilmawati, H., & Sara, E. (2015). Penyulingan Minyak Biji Pala: Pengaruh Ukuran Bahan, Waktu dan Tekanan Penyulingan terhadap Kualitas dan Rendemen Minyak. *Symposium Nasional RAPI XIV-FT UMSFT UMS*, 1(1), 220–226.
- Hikma, N., Burhan, A., Ulfah, N., & Awaluddin, A. (2023). Analisis Profil Metabolit Ekstrak Etanol Daun Temelekar (*Coptosapelta tomentosa* Valetton ex K.Heyne) dengan Metode Spektroskopi FT-IR yang Dikombinasi dengan Kemometrik. *Pharmaceutical Journal of Indonesia*, 20(02), 137–140.
- Hubschmann, H. J. (2015). *Handbook of GC-MS: Fundamentals and Applications*. Wiley.
- Ilmi, I. N., Filianty, F., & Yarlina, V. P. (2022). Sediaan Kayu Manis (*Cinnamomum* Sp.) sebagai Minuman Fungsional Antidiabetes: Kajian Literatur. *Kimia Padjadjaran*, 1(1), 31–59. <https://jurnal.unpad.ac.id/jukimpad>.
- Jumhawan, U., Putri, S. P., Yusianto, Bamba, T., & Fukusaki, E. (2015). Application of Gas Chromatography/Flame Ionization Detector-Based Metabolite Fingerprinting for Authentication of Asian Palm Civet Coffee (Kopi Luwak). *Journal of Bioscience and Bioengineering*, 120(5), 555–561. <https://doi.org/10.1016/j.jbiosc.2015.03.005>.
- Kerdudoa, A., Ellong, E. N., Burgera, P., Gonnota, V., Boyer, L., Chandree, F., Adenetb, S., Rochefortb, K., Michel, T., & Fernandez, X. (2017). Chemical Composition, Antimicrobial and Insecticidal Activities of Flowers Essential Oils of *Alpinia Zerumbet* from Martinique Island. *Chemistry & Biodiversity*, 14(4), 1–26. <https://doi.org/10.1111/ijlh.12426>.
- Kruve, A. (2019). Semi-Quantitative Non-Target Analysis of Water with Liquid Chromatography/High-Resolution Mass Spectrometry: How Far Are We? *Rapid Communications in Mass Spectrometry*, 33(S3), 54–63. <https://doi.org/10.1002/rcm.8208>.
- Kusumaningrum, H. P., Zainuri, M., Endrawati, H., Loka, B. D., Widiassa, I. N., & Sulistyowati, E. (2021). Chemical Compounds in Essential Oil of Nutmeg Leaves (*Myristica fragrans*) from Batang Indonesia. *Journal of Physics: Conference Series*, 1943(1), 1–9. <https://doi.org/10.1088/1742-6596/1943/1/012096>.

- Kusumawardhani, A. R., Dwiyanti, S. P., Nafisa, S., Hidayat, S., Zahra, A. A., & Mierza, V. (2022). Review Jurnal: Isolasi Senyawa Minyak Atsiri Dari Tanaman Lada Hitam (*Piper nigrum* L.) dan Sereh Wangi (*Cymbopogon winterianus* Jowitt). *Jurnal Pendidikan Dan Konseling*, 4(6), 1349–1358.
- Liu, Y., Chang, C., & Zhu, Y. (2022). Advances of Chromatogram Retention Time Alignment Algorithms in Proteomics. *Chinese Journal of Biotechnology*, 38(3), 961–975. <https://doi.org/10.13345/j.cjb.210271>.
- Marchev, A. S., Koycheva, I. K., Aneva, I. Y., & Georgiev, M. I. (2020). Authenticity and Quality Evaluation of Different Rhodiola Species and Commercial Products Based on NMR-Spectroscopy and HPLC. *Phytochemical Analysis*, 31(6), 756–769. <https://doi.org/10.1002/pca.2940>
- Maryati, M. (2023). Isolasi, Karakterisasi, dan Identifikasi Senyawa Kimia dari Minyak Atsiri Biji Pala Papua (*Myristica argentea* Warb). *Gorontalo Agriculture Technology Journal*, 6(2), 65–73. <https://doi.org/10.32662/gatj.v0i0.3212>
- Miao, Q., Kong, W., Zhao, X., Yang, S., & Yang, M. (2015). GC-FID Coupled with Chemometrics for Quantitative and Chemical Fingerprinting Analysis of *Alpinia oxyphylla* Oil. *Journal of Pharmaceutical and Biomedical Analysis*, 102(1), 436–442. <https://doi.org/10.1016/j.jpba.2014.10.014>.
- Morozzi, P., Zappi, A., Gottardi, F., Locatelli, M., & Melucci, D. (2019). A Quick and Efficient Non-Targeted Screening Test for Saffron Authentication: Application of Chemometrics to Gas-Chromatographic Data. *Molecules*, 24(14), 1–13. <https://doi.org/10.3390/molecules24142602>.
- Mubarakunnisa, M., & Gandhimathi, R. (2021). A Review on Role of LC-MS in Metabolomics. *Elementary Education Online*, 20(5), 7795–7800. <https://doi.org/10.17051/ilkonline.2021.05.884>.
- Oliver Fiehn. (2017). Metabolomics by Gas Chromatography-Mass Spectrometry: the combination of targeted and untargeted profiling. *In Curr Protoc Mol Biol*. 7(3), 1-43. <https://doi.org/10.1002/0471142727.mb3004s114.Metabolomics>.
- Pareta, D. N. (2022). Identifikasi Senyawa Metabolit sekunder Minyak Atsiri Biji Pala (*Meristica Fragrans* Houtt) menggunakan Metode GC-MS. *Majalah InfoSains*, 3(2), 100–102. <https://jurnal.fmipaukit.ac.id/index.php/JIS/article/view/66/68>
- Pradina, Y. S., Puteri, A., Rachma, G. F., Balqis, N., Anggraini, G. P., & Wasito, H. (2024). Authentication of Shallots from Brebes using Gas Chromatography Fingerprinting Technique Combined with Chemometrics Authentication of Shallots from Brebes using Gas Chromatography Fingerprinting Technique Combined with Chemometrics. *Makara Journal of Science*, 28(3), 185–193. <https://doi.org/10.7454/mss.v28i3.2464>

- Rathahao-Paris, E., Alves, S., Junot, C., & Tabet, J. C. (2016). High Resolution Mass Spectrometry for Structural Identification of Metabolites in Metabolomics. *Metabolomics*, 12(1), 1–15. <https://doi.org/10.1007/s11306-015-0882-8>
- Riyadi, E., Andarwulan, N., & Faridah, D. N. (2014). Profil Senyawa Volatil Identitas Nutmeg Oil, Patchouli Oil dan Fresh Ginger Oil Asal Indonesia The Volatile Compounds Profile as Identity for Nutmeg Oil, Patchouli Oil and Fresh Ginger Oil from Indonesia 1. *Jurnal Mutu Pangan*, 1(1), 19–25.
- Rochman, A., Irnawati, & Riswanto, F. D. O. (2021). *Kemometrika*. Gadjah Mada University Press.
- Ruwindya, Y. (2022). Perbandingan Detektor FID dan MS dalam Penentuan Sitronelal Minyak Atsiri Sereh Wangi. *IJCA (Indonesian Journal of Chemical Analysis)*, 5(2), 95–102. <https://doi.org/10.20885/ijca.vol5.iss2.art4>
- Samsul Hadi, & Kunti Nastiti. (2022). Autentikasi *G. mangostana* terhadap Adulterasi *G. tinctoria* dengan Metode Spektrofotometri UV-VIS Kombinasi Khemometrik. *Jurnal Pendidikan Mipa*, 12(3), 410–418. <https://doi.org/10.37630/jpm.v12i3.642>.
- Shafirany, M. Z., Susilawati, Y., & Musfiroh, I. (2018). Aplikasi Kemometrik dalam Penentuan Mutu Tumbuhan Obat. *Pharmauho: Jurnal Farmasi, Sains, Dan Kesehatan*, 4(2), 6–13. <https://doi.org/10.33772/pharmauho.v4i2.6257>
- Sharmeen, J. B., Mahomoodally, F. M., Zengin, G., & Maggi, F. (2021). Essential Oils as Natural Sources of Fragrance Compounds for Cosmetics and Cosmeceuticals. *Molecules*, 26(3), 1–24. <https://doi.org/10.3390/molecules26030666>
- Sudrajat, F. R., Mutakin, M., Saputri, F. A., & Shalihah, A. (2018). Review: Analisis Sidik Jari Dalam Kontrol Kualitas Tumbuhan. *Farmaka*, 15(1), 37–46.
- Sugiharto, Y., Natania, E., Febriyanti, S. A., & Krisbianto, O. (2022). Perbandingan Beberapa Detektor Kromatografi Gas dan Aplikasinya Dalam Analisis Pangan. *Journal of Food and Agricultural Product*, 2(1), 23–36.
- Syahrani, R., Umar, A. H., & Matasik, L. C. (2024). Fingerprint Metabolite of Miana (*Coleus* sp.) Leaf Infusion and Juice : Authentication Based on FTIR Spectroscopy and Multivariate Analysis. *AgriTECH*, 44(4), 313–321.
- Todeschini, R., Ballabio, D., & Grisoni, F. (2016). Beware of Unreliable Q2! A Comparative Study of Regression Metrics for Predictivity Assessment of QSAR Models. *Journal of Chemical Information and Modeling*, 56(10), 1905–1913. <https://doi.org/10.1021/acs.jcim.6b00277>
- Trifan, A., Zengin, G., Korona-Glowniak, I., Skalicka-Woźniak, K., & Luca, S. V. (2023). Essential Oils and Sustainability: In Vitro Bioactivity Screening of *Myristica fragrans* Houtt. Post-Distillation By-Products. *Plants*, 12(9), 1-16.

<https://doi.org/10.3390/plants12091741>

- Tsugawa, H., Cajka, T., Kind, T., Ma, Y., Higgins, B., Ikeda, K., Kanazawa, M., VanderGheynst, J., Fiehn, O., & Arita, M. (2015). MS-DIAL: Data Independent MS/MS Deconvolution for Comprehensive. *Nat Methods*, 12(6), 523–526. <https://doi.org/10.1038/nmeth.3393>.MS-DIAL
- Usha, Y. (2023). Pharmaceutical Analytical Chemistry : Open Access The Power of Gas Chromatography: A Breakthrough in Chemical Analysis. *Pharmaceutical Analytical Chemistry*, 8(2), 10–11. <https://doi.org/10.35248/2471-2698.23.8.18>
- Vera, D. N., Jiménez-Carvelo, A. M., Cuadros-Rodríguez, L., Ruisánchez, I., & Callao, M. P. (2019). Authentication of The Geographical Origin of Extra-Virgin Olive Oil of The Arbequina Cultivar by Chromatographic Fingerprinting and Chemometrics. *Talanta*, 203(1), 194–202. <https://doi.org/10.1016/j.talanta.2019.05.064>
- Wen, H., Yang, T., Yang, W., Yang, M., Wang, Y., & Zhang, J. (2023). Comparison of Metabolites and Species Classification of Thirteen Zingiberaceae Spices Based on GC–MS and Multi-Spectral Fusion Technology. *Foods*, 12(20), 1–15. <https://doi.org/10.3390/foods12203714>.
- Zahara, H., Karma, T., & Yusuf, M. (2023). Klasifikasi Daun Biduri (*Calotropis gigantea* L.) dari Lokasi Berbeda Menggunakan Spektroskopi Inframerah dan Kemometrik. *Lantanida Journal*, 11(2), 107–117. <https://doi.org/10.22373/lj.v11i2.15096>
- Zhang, Y. X., Yang, X., Zou, P., Du, P. F., Wang, J., Jin, F., Jin, M. J., & She, Y. X. (2016). Nonylphenol Toxicity Evaluation and Discovery of Biomarkers in Rat Urine by A Metabolomics Strategy Through HPLC-QTOF-MS. *International Journal of Environmental Research and Public Health*, 13(5), 1–17. <https://doi.org/10.3390/ijerph13050501>