

REFERENCES

- Akaji, Y., Hirobe, M., Miyazaki, Y., Makimoto, T., Kinoshita, S., Hattori, I., & Sakamoto, K. (2017). Survival and growth of *Fagus crenata* seedlings in relation to biological and microtopographical factors in a cool temperate broadleaf forest. *Journal of Forest Research*, 22(5), 294–302. <https://doi.org/10.1080/13416979.2017.1354749>
- Alexandre, T. R., Lima, M. L., Galuppo, M. K., Mesquita, J. T., do Nascimento, M. A., dos Santos, A. L., Sartorelli, P., Pimenta, D. C., & Tempone, A. G. (2017). Ergosterol isolated from the basidiomycete *Pleurotus salmoneostramineus* affects *Trypanosoma cruzi* plasma membrane and mitochondria. *Journal of Venomous Animals and Toxins Including Tropical Diseases*, 23(1). <https://doi.org/10.1186/s40409-017-0120-0>
- Altemimi, A., Lakhssassi, N., Baharlouei, A., Watson, D. G., & Lightfoot, D. A. (2017). Phytochemicals: Extraction, isolation, and identification of bioactive compounds from plant extracts. In *Plants* (Vol. 6, Issue 4). MDPI AG. <https://doi.org/10.3390/plants6040042>
- Arieftha, N. R., Kristiana, P., Aboshi, T., Murayama, T., Tawaraya, K., Koseki, T., Kurisawa, N., Kimura, K. ichi, & Shiono, Y. (2018). New isocoumarins, naphthoquinones, and a cleistanthane-type diterpene from *Nectria pseudotrichia* 120-1NP. *Fitoterapia*, 127(January), 356–361. <https://doi.org/10.1016/j.fitote.2018.03.012>
- Arieftha, N. R., Nikmawahda, H. T., Aboshi, T., Murayama, T., Tawaraya, K., Koseki, T., Katagi, G., Kakihara, Y., & Shiono, Y. (2019). Fusaspirols A-D, novel oxaspirol derivatives isolated from *Fusarium solani* B-18. *Tetrahedron*, 75(10), 1371–1377. <https://doi.org/10.1016/j.tet.2019.01.052>

- Banerjee, J., & Karati, D. (2022). Isolation, characterizations, and antimicrobial activities of a phytosterol Dendrosterone isolated from plant *Dendrobium ochreatum*. *Pharmacological Research - Modern Chinese Medicine*, 3(April), 100120. <https://doi.org/10.1016/j.prmcm.2022.100120>
- Cen, S., Fang, Q., Tong, L., Yang, W., Zhang, J., Lou, Q., & Huang, T. (2021). Effects of chitosan-sodium alginate-nisin preservatives on the quality and spoilage microbiota of *Penaeus vannamei* shrimp during cold storage. *International Journal of Food Microbiology*, 349. <https://doi.org/10.1016/j.ijfoodmicro.2021.109227>
- Chitra, G., Franklin D.S, Sudarsan, S., Sakthivel, S., & Guhanathan, S. (2017). Indole-3-acetic acid/diol based pH-sensitive biological macromolecule for antibacterial, antifungal and antioxidant applications. *International Journal of Biological Macromolecules*, 95, 363–375. <https://doi.org/10.1016/j.ijbiomac.2016.11.068>
- Corrêa, R. C. G., Barros, L., Fernandes, Â., Sokovic, M., Bracht, A., Peralta, R. M., & Ferreira, I. C. F. R. (2018). A natural food ingredient based on ergosterol: Optimization of the extraction from: *Agaricus blazei*, evaluation of bioactive properties and incorporation in yogurts. *Food and Function*, 9(3), 1465–1474. <https://doi.org/10.1039/c7fo02007d>
- Dupont, S., Fleurat-Lessard, P., Cruz, R. G., Lafarge, C., Grangeteau, C., Yahou, F., Gerbeau-Pissot, P., Abrahão Júnior, O., Gervais, P., Simon-Plas, F., Cayot, P., & Beney, L. (2021). Antioxidant properties of ergosterol and its role in yeast resistance to oxidation. *Antioxidants*, 10(7). <https://doi.org/10.3390/antiox10071024>
- El Mannoubi, I. (2023). Impact of different solvents on extraction yield, phenolic composition, in vitro antioxidant and antibacterial activities of deseeded *Opuntia stricta*

<https://doi.org/10.1007/s43994-023-00031-y>

- ElObeid, A. S., Kamal-Eldin, A., Abdelhalim, M. A. K., & Haseeb, A. M. (2017). Pharmacological Properties of Melanin and its Function in Health. In *Basic and Clinical Pharmacology and Toxicology* (Vol. 120, Issue 6, pp. 515–522). Blackwell Publishing Ltd. <https://doi.org/10.1111/bcpt.12748>
- Fei, P., Zhang, Z., Wu, Y., Xiao, L., Zhuang, Y., Ding, N., & Huang, B. (2022). Non-radical synthesis of amide chitosan with p-coumaric acid and caffeic acid and its application in pork preservation. *International Journal of Biological Macromolecules*, 222, 1778–1788. <https://doi.org/10.1016/j.ijbiomac.2022.09.263>
- Francenia Santos-Sánchez, N., Salas-Coronado, R., Villanueva-Cañongo, C., & Hernández-Carlos, B. (2019). Antioxidant Compounds and Their Antioxidant Mechanism. In *Antioxidants*. IntechOpen. <https://doi.org/10.5772/intechopen.85270>
- Fujimoto, H., Satoh, Y., Yamaguchi, K., & Yamazaki, M. (1998). Monoamine Oxidase Inhibitory constituents from *Anixiella micropertusa*. *Chemical Pharmacy Bulletin*, 46(10), 1506–1510. <https://doi.org/10.1248/cpb.46.1506>
- Gandhi, A. D., Umamahesh, K., Sathiyaraj, S., Suriyakala, G., Velmurugan, R., al Farraj, D. A., Gawwad, M. R. A., Murugan, K., Babujanarthanam, R., & Saranya, R. (2022). Isolation of bioactive compounds from lichen *Parmelia sulcata* and evaluation of antimicrobial property. *Journal of Infection and Public Health*, 15(4), 491–497. <https://doi.org/10.1016/j.jiph.2021.10.014>
- Gottardo, F. M., Biduski, B., Santos, L. F. dos, Santos, J. S. dos, Rodrigues, L. B., & Santos, L. R. dos. (2022). Microencapsulated oregano and cinnamon essential oils as a natural

alternative to reduce *Listeria monocytogenes* in Italian salami. *Food Bioscience*, 50, 102146. <https://doi.org/10.1016/j.fbio.2022.102146>

Gutzeit, H. O., & Ludwig-Müller, J. (n.d.). *Plant Natural Products Synthesis, Biological Functions and Practical Applications*.

Hanson, J. R. (2007). *The classes of natural product and their isolation* (pp. 1–34). <https://doi.org/10.1039/9781847551535-00001>

Harper, J. K., Arif, A. M., Ford, E. J., Strobel, G. A., Porco, J. A., Tomer, D. P., Oneill, K. L., Heider, E. M., & Grant, D. M. (2003). Pestacin: A 1,3-dihydro isobenzofuran from *Pestalotiopsis microspora* possessing antioxidant and antimycotic activities. *Tetrahedron*, 59(14), 2471–2476. [https://doi.org/10.1016/S0040-4020\(03\)00255-2](https://doi.org/10.1016/S0040-4020(03)00255-2)

Hussain, Z., Li, X., Zhang, D., Hou, C., Ijaz, M., Bai, Y., Xiao, X., & Zheng, X. (2021). Influence of adding cinnamon bark oil on meat quality of ground lamb during storage at 4 °C. *Meat Science*, 171. <https://doi.org/10.1016/j.meatsci.2020.108269>

Islam, M. Z., Park, B. J., & Lee, Y. T. (2021). Influence of temperature conditions during growth on bioactive compounds and antioxidant potential of wheat and barley grasses. *Foods*, 10(11). <https://doi.org/10.3390/foods10112742>

Jahn, L., Hofmann, U., & Ludwig-Müller, J. (2021). Indole-3-acetic acid is synthesized by the endophyte *Cyanoderma asteris* via a tryptophan-dependent and-independent way and mediates the interaction with a non-host plant. *International Journal of Molecular Sciences*, 22(5), 1–19. <https://doi.org/10.3390/ijms22052651>

Ji, Y., Gao, Y., Chen, H., Yin, Y., & Zhang, W. (2019). Indole-3-acetic acid alleviates nonalcoholic fatty liver disease in mice via attenuation of hepatic lipogenesis, and oxidative and inflammatory stress. *Nutrients*, 11(9). <https://doi.org/10.3390/nu11092062>

Abdel-Rahman, A. M. (2022). Using Rosemary Essential Oil as a Potential Natural Preservative during Stirred-like Yogurt Making. *Foods*, 11(14). <https://doi.org/10.3390/foods11141993>

Kaul, S., Wani, M., Lal DHAR, K., & Dhar, M. K. (2008). Production and GC-MS trace analysis of methyl eugenol from endophytic isolate of *Alternaria* from Rose. In *Annals of Microbiology* (Vol. 58, Issue 3).

Kondrasheva, K. V., Egamberdiev, F. B., Suyarova, R. A., Ruzieva, D. M., Nasmetova, S. M., Abdulmyanova, L. A., Rasulova, G. A., & Gulyamova, T. G. (2022). Production of indole-3-acetic acid by endophytic fungi of halophyte plants under salt stress. *IOP Conference Series: Earth and Environmental Science*, 1068(1). <https://doi.org/10.1088/1755-1315/1068/1/012040>

Kumari, P., Singh, A., Singh, D. K., Sharma, V. K., Kumar, J., Gupta, V. K., Bhattacharya, S., & Kharwar, R. N. (2021). Isolation and purification of bioactive metabolites from an endophytic fungus *Penicillium citrinum* of *Azadirachta indica*. *South African Journal of Botany*, 139, 449–457. <https://doi.org/10.1016/j.sajb.2021.02.020>

Lewis, S. M., Hotchkiss, C. E., & Ullrey, D. E. (2005). Nutrition and Nutritional Diseases. In *The Laboratory Primate*. <https://doi.org/10.1016/B978-0-12-080261-6.50013-1>

Liu, X., Dong, M., Chen, X., Jiang, M., Lv, X., & Zhou, J. (2008). Antimicrobial activity of an endophytic *Xylaria* sp.YX-28 and identification of its antimicrobial compound 7-amino-4-methylcoumarin. *Applied Microbiology and Biotechnology*, 78(2), 241–247. <https://doi.org/10.1007/s00253-007-1305-1>

- G. D., Grumezescu, A. M., Bejenaru, C., & Bejenaru, L. E. (2017). Natural products used for food preservation. In *Food Preservation* (pp. 365–411). Elsevier. <https://doi.org/10.1016/b978-0-12-804303-5.00011-0>
- Narsaiah, K., Wilson, R. A., Gokul, K., Mandge, H. M., Jha, S. N., Bhadwal, S., Anurag, R. K., Malik, R. K., & Vij, S. (2015). Effect of bacteriocin-incorporated alginate coating on shelf-life of minimally processed papaya (*Carica papaya* L.). *Postharvest Biology and Technology*, 100, 212–218. <https://doi.org/10.1016/j.postharvbio.2014.10.003>
- Nicolau-Lapeña, I., Aguiló-Aguayo, I., Kramer, B., Abadias, M., Viñas, I., & Muranyi, P. (2021). Combination of ferulic acid with Aloe vera gel or alginate coatings for shelf-life prolongation of fresh-cut apples. *Food Packaging and Shelf Life*, 27. <https://doi.org/10.1016/j.fpsl.2020.100620>
- Nicoletti, R., & Fiorentino, A. (2015). Plant bioactive metabolites and drugs produced by endophytic fungi of spermatophyta. In *Agriculture (Switzerland)* (Vol. 5, Issue 4, pp. 918–970). MDPI AG. <https://doi.org/10.3390/agriculture5040918>
- Ouellette, R. J., & Rawn, J. D. (2018). Methods for Structure Determination Nuclear Magnetic Resonance and Mass Spectrometry. In *Organic Chemistry* (pp. 427–461). Elsevier. <https://doi.org/10.1016/b978-0-12-812838-1.50015-3>
- Packiam, K. K., George, T. S., Samy, K., Guru, S., Vasanthi, S., & Kannan, K. P. (2011). Extraction, purification and characterization of chitosan from endophytic fungi isolated from medicinal plants Endophytic fungi from *Mimusops elengi* View project EXTRACTION, PURIFICATION AND CHARACTERIZATION OF CHITOSAN FROM ENDOPHYTIC FUNGI ISOLATED FROM MEDICINAL PLANTS. In *World Journal of Science and Technology* | www.worldjournalofscience.com | (Vol. 1, Issue 4). www.worldjournalofscience.com

Quintin, T. J. (2009). Chromatography : types, techniques and methods. In T. J. Quintin (Ed.), *Chromatography Types, Techniques, and Methods*.

Ratnaningtyas, N. I., Purnomowati, Purwati, E. S., Septiana, A. T., Ekowati, N., & Supriyadi, A. (2018). Antioxidant Potential of Ethanol and Ethyl Acetat Extract of *Ganoderma* sp. *Mycelium*. *Biosaintifika*, *10*(1), 87–94.
<https://doi.org/10.15294/biosaintifika.v10i1.11512>

Reuhs, B. L., & Rounds, M. A. (2010). *High-Performance Liquid Chromatography* (pp. 499–512). https://doi.org/10.1007/978-1-4419-1478-1_28

Sari, A. P., Nurlelasari, Azhari, A., Harneti, D., Maharani, R., Mayanti, T., Farabi, K., Darwati, Supratman, U., Fajriah, S., Azmi, M. N., & Shiono, Y. (2022). New Ergostane-Type Sterol Produced by an Endophytic Fungus *Fusarium phaseoli* Isolated from *Chisocheton macrophyllus* (Meliaceae). *Records of Natural Products*, *16*(6), 614–621.
<https://doi.org/10.25135/mp.334.2203.2387>

Sigurdson, G. T., Tang, P., & Giusti, M. M. (2018). Cis-trans configuration of coumaric acid acylation affects the spectral and colorimetric properties of anthocyanins. *Molecules*, *23*(3). <https://doi.org/10.3390/molecules23030598>

Silva, C. de S., Figueiredo, H. M. de, Stamford, T. L. M., & Silva, L. H. M. da. (2019). Inhibition of *Listeria monocytogenes* by *Melaleuca alternifolia* (tea tree) essential oil in ground beef. *International Journal of Food Microbiology*, *293*, 79–86.
<https://doi.org/10.1016/j.ijfoodmicro.2019.01.004>

Stiles, M. E. (1996). Biopreservation by lactic acid bacteria. In *Antonie van Leeuwenhoek* (Vol. 70). Kluwer Academic Publishers.

& Domenek, S. (2023). Bixin, a performing natural antioxidant in active food packaging for the protection of oxidation sensitive food. *LWT*, 180. <https://doi.org/10.1016/j.lwt.2023.114730>

Suwanamornlert, P., Kerddonfag, N., Sane, A., Chinsirikul, W., Zhou, W., & Chonhenchob, V. (2020). Poly(lactic acid)/poly(butylene-succinate-co-adipate) (PLA/PBSA) blend films containing thymol as alternative to synthetic preservatives for active packaging of bread. *Food Packaging and Shelf Life*, 25. <https://doi.org/10.1016/j.fpsl.2020.100515>

Suwanarach, N., Kumla, J., Watanabe, B., Matsui, K., & Lumyong, S. (2019). Characterization of melanin and optimal conditions for pigment production by an endophytic fungus, *Spissiomycetes endophytica* SDBR-CMU319. *PLoS ONE*, 14(9). <https://doi.org/10.1371/journal.pone.0222187>

Tao, R., Wang, C. Z., & Kong, Z. W. (2013). Antibacterial/antifungal activity and synergistic interactions between polyprenols and other lipids isolated from *Ginkgo Biloba* L. leaves. *Molecules*, 18(2), 2166–2182. <https://doi.org/10.3390/molecules18022166>

Uesugi, S., Fujisawa, N., Yoshida, J., Watanabe, M., Dan, S., Yamori, T., Shiono, Y., & Kimura, K. I. (2016). Pyrrocidine A, a metabolite of endophytic fungi, has a potent apoptosis-inducing activity against HL60 cells through caspase activation via the Michael addition. *Journal of Antibiotics*, 69(3), 133–140. <https://doi.org/10.1038/ja.2015.103>

Venkateswarulu, N., Shameer, S., Bramhachari, P. v., Basha, S. K. T., Nagaraju, C., & Vijaya, T. (2018). Isolation and characterization of plumbagin (5- hydroxyl- 2- methyl-naptalene-1,4-dione) producing endophytic fungi *Cladosporium delicatulum* from endemic medicinal plants: Isolation and characterization of plumbagin producing

<https://doi.org/10.1016/j.btre.2018.e00282>

Wang, D., Xiao, H., Lyu, X., Chen, H., & Wei, F. (2023). Lipid oxidation in food science and nutritional health: A comprehensive review. In *Oil Crop Science* (Vol. 8, Issue 1, pp. 35–44). KeAi Communications Co. <https://doi.org/10.1016/j.ocsci.2023.02.002>

Widjajanti, H., Handayani, C. V., & Nurnawati, E. (2021). Antibacterial activity of endophytic fungi from sembukan (*paederia foetida* l.) leaves. *Science and Technology Indonesia*, 6(3), 189–195. <https://doi.org/10.26554/sti.2021.6.3.189-195>

Yedjou, C. G., Moore, P., & Tchounwou, P. B. (2006). Dose-and Time-Dependent Response of Human Leukemia (HL-60) Cells to Arsenic Trioxide Treatment. In *Int. J. Environ. Res. Public Health* (Vol. 3, Issue 2). www.ijerph.org

Yehia, R. S., Osman, G. H., Assagaf, H., Salem, R., & Mohamed, M. S. M. (2020). Isolation of potential antimicrobial metabolites from endophytic fungus *Cladosporium cladosporioides* from endemic plant *Zygophyllum mandavillei*. *South African Journal of Botany*, 134, 296–302. <https://doi.org/10.1016/j.sajb.2020.02.033>

Yunker, L. P. E., Stoddard, R. L., & McIndoe, J. S. (2014). Practical approaches to the ESI-MS analysis of catalytic reactions. In *Journal of Mass Spectrometry* (Vol. 49, Issue 1, pp. 1–8). John Wiley and Sons Ltd. <https://doi.org/10.1002/jms.3303>

Zhang, H., Zhang, C., Wang, X., Huang, Y., Xiao, M., Hu, Y., & Zhang, J. (2022). Antifungal electrospinning nanofiber film incorporated with *Zanthoxylum bungeanum* essential oil for strawberry and sweet cherry preservation. *LWT*, 169. <https://doi.org/10.1016/j.lwt.2022.113992>



UNIVERSITAS
GADJAH MADA

**ISOLATION AND IDENTIFICATION OF ANTIOXIDANT COMPOUNDS FROM ENDOPHYTIC FUNGI OF
Fagus crenata AS
CANDIDATE OF NATURAL FOOD PRESERVATIVES**

Fauziyyah Ariffa, Dr. Widiastuti Setyaningsih, S.T.P., M.Sc.; Dr. Yoshihito Shiono

Universitas Gadjah Mada, 2023 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Zhang, J., Li, Y., Yang, X., Liu, X., Hong, H., & Luo, Y. (2021). Effects of oregano essential oil and nisin on the shelf life of modified atmosphere packed grass carp (*Ctenopharyngodon idellus*). *LWT*, 147. <https://doi.org/10.1016/j.lwt.2021.111609>

Zou, W. X., Meng, J. C., Lu, H., Chen, G. X., Shi, G. X., Zhang, T. Y., & Tan, R. X. (2000). Metabolites of *Colletotrichum gloeosporioides*, an endophytic fungus in *Artemisia mongolica*. *Journal of Natural Products*, 63(11), 1529–1530. <https://doi.org/10.1021/np000204t>