

REFERENSI

Afriani, N., Yusmarini, & Pato, U. (2017). Aktivitas Antimikroba *Lactobacillus Plantarum* 1 Yang Diisolasi Dari Industri Pengolahan Pati Sagu Terhadap Bakteri Patogen *Escherichia Coli* Fnc-19 Dan *Staphylococcus Aureus* Fnc-15. *Jom Faperta*, 4(2).

Alang, H., Kusnadi, J., Ardiyati, T., & Suharjono. (2019). Identification of lactic acid bacteria as antimicrobial from milk Toraja Belang buffalo. *IOP Conference Series: Earth and Environmental Science*, 230(1). <https://doi.org/10.1088/1755-1315/230/1/012092>

Alvarez-Sieiro, P., Montalbán-López, M., Mu, D., & Kuipers, O. P. (2016). Bacteriocins Of Lactic Acid Bacteria: Extending The Family. In *Applied Microbiology And Biotechnology* (Vol. 100, Issue 7, Pp. 2939–2951). Springer Verlag. <https://doi.org/10.1007/S00253-016-7343-9>

Arifin, M., Budiman, C., Fujiyama, K., & Arief, I. I. (2021). Kinetic and thermodynamic study of plantaricin IIA-1A5. *Protein and Peptide Letters*, 28(6), 680–686. <https://doi.org/10.2174/0929866527999201123213841>

Aritonang, S. N., Roza, E., Rossi, E., Purwati, E., & Husmaini. (2017). Isolation And Identification Of Lactic Acid Bacteria From Okara And Evaluation Of Their Potential As Candidate Probiotics. *Pakistan Journal Of Nutrition*, 16(8), 618–628. <https://doi.org/10.3923/Pjn.2017.618.628>

Ashardiono, F., & Trihartono, A. (2024). *Optimizing the potential of Indonesian coffee: A dual market approach*. **Cogent Social Sciences**, 10(1). <https://doi.org/10.1080/23311886.2024.2340206>

Azhar, M. A., & Abdul Munaim, M. S. (2019). Identification and evaluation of probiotic potential in yeast strains found in kefir drink samples from Malaysia. *International Journal of Food Engineering*, 15. <https://doi.org/10.1515/ijfe-2018-0347>

Bastian, F., Hutabarat, O. S., Dirpan, A., Nainu, F., Harapan, H., Emran, T. Bin, & Simal-Gandara, J. (2021). From Plantation To Cup: Changes In Bioactive

<https://doi.org/10.3390/Foods10112827>

Baswendra Triadi, B., Suwarno, S., Sarudji, S., Damayanti, R., Sugihartuti, R., & Estoepangesti, A. T. S. (2022). Antibiotic sensitivity test of *Escherichia coli* and *Staphylococcus aureus* from dairy cows. *Ovozoa: Journal of Animal Reproduction*, *11*(2), 72–80. <https://doi.org/10.20473/ovz.v11i2.2022.72-80>

Bendig, T., Ulmer, A., Luzia, L., Müller, S., Sahle, S., Bergmann, F. T., et al. (2023). The pH-dependent lactose metabolism of *L. delbrueckii* subsp. *bulgaricus*. *Journal of Biotechnology*, *374*, 90–100. <https://doi.org/10.1016/j.jbiotec.2023.08.001>

Bernardes, P. C., Coelho, J. M., Martins, P. M. M., & Schwan, R. F. (2024). Microbial Ecology And Fermentation Of *Coffea Canephora*. *Frontiers In Food Science And Technology*, *4*. <https://doi.org/10.3389/frfst.2024.1377226>

Borém, F. M., Salvio, L. G. A., Correa, J. L. G., Alves, A. P. C., Dos Santos, C. M., Haeberlin, L., Cirillo, M. A., & Schwan, R. F. (2024). Influence of fermentation time and inoculation of starter culture on the chemical composition of fermented natural coffee followed by depulping. *Anais da Academia Brasileira de Ciências*, *96*(Suppl. 1), e20240083. <https://doi.org/10.1590/0001-3765202420240083>

Bps. (2023). *Statistik Kopi Indonesia Indonesian Coffee Statistics 2022*. *7*, 1–91.

Bressani, A. P. P., Martinez, S. J., Sarmiento, A. B. I., Borém, F. M., & Schwan, R. F. (2020). Organic Acids Produced During Fermentation And Sensory Perception In Specialty Coffee Using Yeast Starter Culture. *Food Research International*, *128*. <https://doi.org/10.1016/j.foodres.2019.108773>

Brioschi Junior, D., Carvalho Guarçoni, R., De Cássia Soares Da Silva, M., Gomes Reis Veloso, T., Catarina Megumi Kasuya, M., Catarina Da Silva Oliveira, E., Maria Rodrigues Da Luz, J., Rizzo Moreira, T., Grancieri Debona, D., & Louzada Pereira, L. (2021). Microbial Fermentation Affects Sensorial, Chemical, And

<https://doi.org/10.1016/j.foodchem.2020.128296>

Cassimiro, D. M. De J., Batista, N. N., Fonseca, H. C., Oliveira Naves, J. A., Coelho, J. M., Bernardes, P. C., Dias, D. R., & Schwan, R. F. (2023). Wet Fermentation Of *Coffea Canephora* By Lactic Acid Bacteria And Yeasts Using The Self-Induced Anaerobic Fermentation (Siaf) Method Enhances The Coffee Quality. *Food Microbiology*, 110. <https://doi.org/10.1016/j.fm.2022.104161>

Cassimiro, D. M. J., Batista, N. N., Fonseca, H. C., Naves, J. A. O., Dias, D. R., & Schwan, R. F. (2022). Coinoculation of lactic acid bacteria and yeasts increases the quality of wet fermented Arabica coffee. *International Journal of Food Microbiology*, 369. <https://doi.org/10.1016/j.ijfoodmicro.2022.109627>

Ciani, M., Capece, A., Comitini, F., Canonico, L., Siesto, G., & Romano, P. (2016). Yeast Interactions In Inoculated Wine Fermentation. In *Frontiers In Microbiology* (Vol. 7, Issue Apr). Frontiers Research Foundation. <https://doi.org/10.3389/fmicb.2016.00555>

Couto, C. De C., Freitas-Silva, O., Oliveira, E. M. M., Sousa, C., & Casal, S. (2022). Near-Infrared Spectroscopy Applied To The Detection Of Multiple Adulterants In Roasted And Ground Arabica Coffee. *Foods*, 11(1). <https://doi.org/10.3390/foods11010061>

Da Costa, R. J., Voloski, F. L. S., Mondadori, R. G., Duval, E. H., & Fiorentini, Â. M. (2019). Preservation Of Meat Products With Bacteriocins Produced By Lactic Acid Bacteria Isolated From Meat. In *Journal Of Food Quality* (Vol. 2019). Hindawi Limited. <https://doi.org/10.1155/2019/4726510>

Da Mota, M. C. B., Batista, N. N., Rabelo, M. H. S., Ribeiro, D. E., Borém, F. M., & Schwan, R. F. (2020). Influence Of Fermentation Conditions On The Sensorial Quality Of Coffee Inoculated With Yeast. *Food Research International*, 136. <https://doi.org/10.1016/j.foodres.2020.109482>

da Silva Vale, A., de Melo Pereira, G. V., de Carvalho Neto, D. P., Sorto, R. D., Goés-Neto, A., Kato, R., & Soccol, C. R. (2021). Facility-specific “house”

microbiome ensures the maintenance of functional microbial communities into coffee beans fermentation: Implications for source tracking. *Environmental Microbiology Reports*, 13(4), 470–481. <https://doi.org/10.1111/1758-2229.12921>

da Silva Vale, A., de Melo Pereira, G. V., de Carvalho Neto, D. P., Rodrigues, C., Pagnoncelli, M. G. B., & Soccol, C. R. (2019). Effect of co-inoculation with *Pichia fermentans* and *Pediococcus acidilactici* on metabolite production and volatile composition of coffee beans. *Fermentation*, 5(3), 67. <https://doi.org/10.3390/fermentation5030067>

Darbandi, A., Asadi, A., Mahdizade Ari, M., Ohadi, E., Talebi, M., Halaj Zadeh, M., Darb Emamie, A., Ghanavati, R., & Kakanj, M. (2022). Bacteriocins: Properties And Potential Use As Antimicrobials. In *Journal Of Clinical Laboratory Analysis* (Vol. 36, Issue 1). John Wiley And Sons Inc. <https://doi.org/10.1002/Jcla.24093>

De Bruyn, F., Zhang, S. J., Pothakos, V., Torres, J., Lambot, C., Moroni, A. V., et al. (2017). Exploring postharvest processing impacts on coffee microbiota. *Applied and Environmental Microbiology*, 83(1). <https://doi.org/10.1128/AEM.02398-16>

de Carvalho Neto, D. P., de Melo Pereira, G. V., Finco, A. M. O., Letti, L. A. J., da Silva, B. J. G., Vandenberghe, L. P. S., & Soccol, C. R. (2018). Efficient mucilage removal via lactic acid fermentation in stir-tank bioreactors. *Food Bioscience*, 26, 80–87. <https://doi.org/10.1016/j.fbio.2018.10.005>

De Giani, A., Bovio, F., Forcella, M., Fusi, P., Sello, G., & Di Gennaro, P. (2019). Identification of a bacteriocin-like compound from *L. plantarum*. *AMB Express*, 9(1). <https://doi.org/10.1186/s13568-019-0813-6>

De Melo Pereira, G. V., De Carvalho Neto, D. P., Magalhães Júnior, A. I., Vásquez, Z. S., Medeiros, A. B. P., Vandenberghe, L. P. S., & Soccol, C. R. (2019). Exploring The Impacts Of Postharvest Processing On The Aroma Formation Of Coffee Beans – A Review. In *Food Chemistry* (Vol. 272, Pp. 441–452). Elsevier Ltd. <https://doi.org/10.1016/J.Foodchem.2018.08.061>

Lara, J. M. R., Gollo, A. L., & Soccol, C. R. (2014). Isolation, Selection And Evaluation Of Yeasts For Use In Fermentation Of Coffee Beans By The Wet Process. *International Journal Of Food Microbiology*, 188, 60–66. <https://doi.org/10.1016/j.ijfoodmicro.2014.07.008>

Dewi, N. P. K. C., Hidayati, A. R., & Hanifa, N. I. (2023a). Aktivitas Antibakteri Senyawa Fenolik Dari Fraksi Kulit Buah Kopi Robusta (*Coffea Canephora* L.). *Unram Medical Journal*, 12(3), 30–33. <https://doi.org/10.29303/Jku.V12i3.952>

Dianastri, R. N. T., Astuti, P., & Prasetya, R. C. (2021). Daya Hambat Ekstrak Biji Kopi Robusta (*Coffea Canephora*) Terhadap Bakteri *Porphyromonas Gingivalis* (In Vitro) (Minimum Inhibitory Effect Robusta Coffee Seeds (*Coffea Canephora*) Extract Towards *Porphyromonas Gingivalis* (In Vitro)). *Stomatognatic (J.K.G Unej)*, 18(2), 69–73.

Dias, S. R., Bressani, A. P. P., Batista, N. N., Dias, D. R., & Schwan, R. F. (2025). Increasing the quality and complexity of pulped coffee fermentation. *European Food Research and Technology*, 251(2), 283–297. <https://doi.org/10.1007/s00217-024-04640-7>

Dwiantara, W. S., & Widya Rahmawati. (2023). Isolasi Bakteri Bacillaceae Untuk Memenuhi Kebutuhan Bahan Praktikum Di Laboratorium Teknologi Rekayasa Pangan. *Jurnal Pengembangan Potensi Laboratorium*, 2(1), 12–17. <https://doi.org/10.25047/Plp.V2i1.3693>

Egan, K., Field, D., Rea, M. C., Ross, R. P., Hill, C., & Cotter, P. D. (2016). Bacteriocins: Novel Solutions To Age Old Spore-Related Problems? In *Frontiers In Microbiology* (Vol. 7, Issue Apr). Frontiers Media S.A. <https://doi.org/10.3389/fmicb.2016.00461>

Elhalis, H., Cox, J., & Zhao, J. (2020). Microbial ecology in wet fermentation of Australian coffee. *International Journal of Food Microbiology*, 321. <https://doi.org/10.1016/j.ijfoodmicro.2020.108544>

Elhalis, H., Cox, J., Frank, D., & Zhao, J. (2021). Microbiological And Biochemical Performances Of Six Yeast Species As Potential Starter Cultures For Wet Fermentation Of Coffee Beans. *Lwt*, 137. <https://doi.org/10.1016/j.lwt.2020.110430>

Elhalis, H., Cox, J., Frank, D., & Zhao, J. (2021). Wet fermentation enhances coffee flavor and aroma. *European Food Research and Technology*, 247(2), 485–498. <https://doi.org/10.1007/s00217-020-03641-6>

Englezos, V., Torchio, F., Vagnoli, P., Krieger-Weber, S., Rantsiou, K., & Cocolin, L. (2020). Impact of *Saccharomyces cerevisiae* strain selection on malolactic fermentation. *American Journal of Enology and Viticulture*, 71(2), 157–165. <https://doi.org/10.5344/ajev.2019.19061>

Evangelista, S. R., Silva, C. F., Miguel, M. G. P. C., et al. (2014). Coffee quality improvement using selected yeasts. *Food Research International*, 61, 183–195. <https://doi.org/10.1016/j.foodres.2013.11.033>

Evangelista, S. R., Silva, C. F., Miguel, M. G. P. Da C., Cordeiro, C. De S., Pinheiro, A. C. M., Duarte, W. F., & Schwan, R. F. (2014). Improvement Of Coffee Beverage Quality By Using Selected Yeasts Strains During The Fermentation In Dry Process. *Food Research International*, 61, 183–195. <https://doi.org/10.1016/j.foodres.2013.11.033>

Fabián, J. C. P., Contreras, A. K. Á., Bonifacio, I. N., et al. (2025). Toward safer food preservation: A review of bacteriocins. *Bioscience Reports*, 45(4), 277–302. <https://doi.org/10.1042/BSR20241594>

Fernandes, A., & Jobby, R. (2022). Bacteriocins from lactic acid bacteria and their potential clinical applications. *Applied Biochemistry and Biotechnology*, 194, 4377–4399. <https://doi.org/10.1007/s12010-022-03870-3>

Gupta, A., & Tiwari, S. K. (2014). Plantaricin LD1 from *Lactobacillus plantarum* LD1. *Applied Biochemistry and Biotechnology*, 172(7), 3354–3362. <https://doi.org/10.1007/s12010-014-0775-8>

Haile, M., & Kang, W. H. (2019). The Role Of Microbes In Coffee Fermentation And Their Impact On Coffee Quality. In *Journal Of Food Quality* (Vol. 2019). Hindawi Limited. <https://doi.org/10.1155/2019/4836709>

Hall, R. D., Trevisan, F., & De Vos, R. C. H. (2022). Coffee Berry And Green Bean Chemistry – Opportunities For Improving Cup Quality And Crop Circularity. In *Food Research International* (Vol. 151). Elsevier Ltd. <https://doi.org/10.1016/j.foodres.2021.110825>

Hamdouche, Y., Meile, J. C., Nganou, D. N., Durand, N., Teyssier, C., & Montet, D. (2016). Discrimination Of Post-Harvest Coffee Processing Methods By Microbial Ecology Analyses. *Food Control*, 65, 112–120. <https://doi.org/10.1016/j.foodcont.2016.01.022>

Handayani, D. R., Djamaludin, M., & Prayoga, A. M. (2021). Uji Toksisitas Akut Ekstrak Etanol Biji Kopi Lampung (*Coffea Canephora* Var. Robusta) Pada Tikus Wistar (Acute Toxicity Test Of Lampung Coffee Bean (*Coffea Canephora* Var. Robusta) Ethanol Extract On Wistar Rats). 4(5), 567–578.

Hu, Y., Xing, K., Li, X., et al. (2023). Cyclodextrin carboxylate improves nisin stability. *NPJ Science of Food*, 7(1). <https://doi.org/10.1038/s41538-023-00181-7>

Hussein, A. O., Khalil, K., Zaini, N. A. M., Atya, A. K. A., & Aqma, W. S. (2025). Antimicrobial activity of *Lactobacillus* spp. from fermented foods. *PeerJ*, 13(1). <https://doi.org/10.7717/peerj.18541>

Ibrahim, S. A., Ayivi, R. D., Zimmerman, T., Siddiqui, S. A., Altemimi, A. B., Fidan, H., Esatbeyoglu, T., & Bakhshayesh, R. V. (2021). Lactic acid bacteria as antimicrobial agents: Food safety and microbial food spoilage prevention. *Foods*, 10(12), 3131. <https://doi.org/10.3390/foods10123131>

Ico. (2023). *Coffee Report And Outlook 2023*.

Janne Carvalho Ferreira, L., De Souza Gomes, M., Maciel De Oliveira, L., & Diniz Santos, L. (2023). Coffee Fermentation Process: A Review. In *Food Research International* (Vol. 169). Elsevier Ltd. <https://doi.org/10.1016/j.foodres.2023.112793>



Jatmiko, Y. D., Sunarjo, S., Ardyati, T., Mustamin, A., Puja, L. R., Arifah, S. N., & Atho'illah, M. F. (2025). Unlocking probiotic potential from wine coffee. *Coffee Science*, 20. <https://doi.org/10.25186/v20i.2341>

Ji, Q.-Y., Wang, W., Yan, H., Qu, H., Liu, Y., Qian, Y., & Gu, R. (2023). The effect of different organic acids and their combination on the cell barrier and biofilm of *Escherichia coli*. *Foods*, 12(16), 3011. <https://doi.org/10.3390/foods12163011>

Jiao, Y., Cai, M., Tang, W., Wang, Z., & Liu, Y. (2025). Effects of starter strains on dry-fermented sausages. *Foods*, 14(10). <https://doi.org/10.3390/foods14101675>

Junqueira, A. C. O., Pereira, G. V. M., Medina, J. D. C., Alvear, M. C. R., Rosero, R., Carvalho Neto, D. P., et al. (2019). First description of bacterial and fungal communities in Colombian coffee beans fermentation analysed using Illumina-based amplicon sequencing. *Scientific Reports*, 9, 1–10.

Kanita, A. B. S., & Jatmiko, Y. D. (2023). Screening And Identification Of Potential Indigenous Yeasts Isolated During Fermentation Of Wine Coffee. *Malaysian Applied Biology*, 52(3), 1–11. <https://doi.org/10.55230/Mabjournal.V52i3.2562>

Karbowiak, M., Wójcicki, M., Hyun, J.-E., Szymański, P., Niu, Y.-D., & Zielińska, D. (2025). Novel antimicrobial compounds from fermented foods. *LWT*, 234. <https://doi.org/10.1016/j.lwt.2025.118597>

Kaur Sidhu, P., & Nehra, K. (2021). Bacteriocins of lactic acid bacteria as potent antimicrobial peptides against food pathogens. In *IntechOpen*. <https://doi.org/10.5772/intechopen.95747>

Kim, S. G., Abbas, A., & Moon, G. S. (2024). Improved functions of fermented coffee by lactic acid bacteria. *Applied Sciences*, 14(17). <https://doi.org/10.3390/app14177596>

Kulapichitr, F., Borompichaichartkul, C., Pratontep, S., Lopetcharat, K., Boonbumrung, S., & Suppavorasatit, I. (2017). Differences In Volatile Compounds And Antioxidant Activity Of Ripe And Unripe Green Coffee Beans (*Coffea*

<https://doi.org/10.17660/Actahortic.2017.1179.41>

Kuniyoshi, T. M., O'Connor, P. M., Lawton, E., et al. (2022). Oxidation resistant pediocin PA-1 derivative. *Gut Microbes*, 14(1).

<https://doi.org/10.1080/19490976.2021.2004071>

Kusmarwati, E., Rachman Arief, F., & Haryati, S. (n.d.). *Eksplorasi bakteriosin dari bakteri asam laktat asal rusip Bangka dan Kalimantan*. Balai Besar Riset Pengolahan Produk dan Bioteknologi Kelautan dan Perikanan.

Lee, L. W., Cheong, M. W., Curran, P., Yu, B., & Liu, S. Q. (2015). Coffee Fermentation And Flavor - An Intricate And Delicate Relationship. In *Food Chemistry* (Vol. 185, Pp. 182–191). Elsevier Ltd.

<https://doi.org/10.1016/J.Foodchem.2015.03.124>

Ligar, B. W., Madenda, S., Mardian, S. S., & Kusuma, T. M. (2022). Functional requirements and traceability modeling in Java Preanger coffee supply chain. *Proceedings of ICIMCIS 2022*, 99–104.

<https://doi.org/10.1109/ICIMCIS56303.2022.10017857>

Lopes, G. R., Passos, C. P., Rodrigues, C., Teixeira, J. A., & Coimbra, M. A. (2020). Impact Of Microwave-Assisted Extraction On Roasted Coffee Carbohydrates, Caffeine, Chlorogenic Acids And Coloured Compounds. *Food Research International*, 129. <https://doi.org/10.1016/J.Foodres.2019.108864>

Mahingsapun, R., Tantayotai, P., Panyachanakul, T., Samosorn, S., Dolsophon, K., Jiamjariyatam, R., Lorliam, W., Srisuk, N., & Krajangsang, S. (2022). Enhancement Of Arabica Coffee Quality With Selected Potential Microbial Starter Culture Under Controlled Fermentation In Wet Process. *Food Bioscience*, 48. <https://doi.org/10.1016/J.Fbio.2022.101819>

Mahmood, T., Masud, T., Ali, S., Abbasi, K. S., & Liaquat, M. (2015). Optimization of bacteriocin produced by *Lactobacillus bulgaricus* TLBFT06. *Pakistan Journal of Pharmaceutical Sciences*, 28(2), 561–567.



UNIVERSITAS
GADJAH MADA

PROFIL BAKTERIOSIN PUTATIF DAN KUALITAS KOPI ROBUSTA (*Coffea canephora* Pierre ex A Froehner) HASIL FERMENTASI KERING DENGAN KO-INOKULASI *Lactobacillus bulgaricus* dan *Saccharomyces cerevisiae*

Aryan Mustamin, Sari Darmasiwi, S.Si., M.Biotech., Ph.D.

Maias, S. (2020). The Role Of Yeasts In Fermentation Processes. In *Microorganisms* (Vol. 8, Issue 8, Pp. 1–8). Mdpi Ag. <https://doi.org/10.3390/microorganisms8081142>

Mardhatilah, D., Padama, F., & Ngatirah. (2023). Development Of Sustainable Arabica Coffee Fermentation Using Yeast Starter. *Iop Conference Series: Earth And Environmental Science*, 1241(1). <https://doi.org/10.1088/1755-1315/1241/1/012078>

Marsya, N. M., & Yuwono, H. S. (2021). Aktivitas Antibakteri Ekstrak Air Kopi Robusta (*Coffea Canephora*) Terhadap Bakteri *Pseudomonas Aeruginosa*. *Jurnal Riset Kedokteran*, 1(1), 55–58. <https://doi.org/10.29313/jrk.v1i1.317>

Martínez-Tomé, M., Jiménez-Monreal, A. M., García-Jiménez, L., Almela, L., García-Diz, L., Mariscal-Arcas, M., & Murcia, M. A. (2011). Assessment Of Antimicrobial Activity Of Coffee Brewed In Three Different Ways From Different Origins. *European Food Research And Technology*, 233(3), 497–505. <https://doi.org/10.1007/s00217-011-1539-0>

Martinez, S. J., Rabelo, M. H. S., Bressani, A. P. P., Da Mota, M. C. B., Borém, F. M., & Schwan, R. F. (2021). Novel Stainless Steel Tanks Enhances Coffee Fermentation Quality. *Food Research International*, 139. <https://doi.org/10.1016/j.foodres.2020.109921>

Mawardi, I., Revida, E., Diana, M., Lubis, A. N. F., & Sriwahyuni, L. (2019). Penerapan teknologi tepat guna pascapanen dalam upaya peningkatan produktifitas petani kopi di Kabupaten Bener Meriah. *Caradde*, 1(2), 205–213.

Mendes, F., Sieuwerts, S., de Hulster, E., et al. (2013). Transcriptome characterization of *S. cerevisiae* and *L. delbrueckii* cocultures. *Applied and Environmental Microbiology*, 79(19), 5949–5961. <https://doi.org/10.1128/AEM.01115-13>

Miglani, R., Parveen, N., Kumar, A., et al. (2022). Bacteriocin and its biomedical applications. In *Recent Advances and Future Perspectives*. <https://doi.org/10.1016/B978-0-323-90113-0.00001-8>



Antibacterial activity and organic acids formation by *Lactobacillus* sp. *Journal of Sustainability Science and Management*, 17(2), 286–295.

<https://doi.org/10.46754/jssm.2022.02.020>

Mokoena, M. P. (2017a). Lactic Acid Bacteria And Their Bacteriocins: Classification, Biosynthesis And Applications Against Uropathogens: A Mini-Review. In *Molecules* (Vol. 22, Issue 8). Mdpi Ag. <https://doi.org/10.3390/Molecules22081255>

Mokoena, M. P., Omatola, C. A., & Olaniran, A. O. (2021). Applications of lactic acid bacteria and their bacteriocins against food spoilage microorganisms and foodborne pathogens. *Molecules*, 26(22), 7055.

<https://doi.org/10.3390/molecules26227055>

Mudoor Soresh, M., Willing, B. P., & Bourrie, B. C. T. (2023). Opportunities and challenges of understanding community assembly in spontaneous food fermentation. *Foods*, 12(3), 673. <https://doi.org/10.3390/foods12030673>

Mukherjee, P., & Sivaprakasam, S. (2025). Metabolic engineering of *Lactobacillus delbrueckii* subsp. *bulgaricus* VI104 as a D-lactic acid cell factory. *World Journal of Microbiology & Biotechnology*, 41(8), 273. <https://doi.org/10.1007/s11274-025-04489-2>

Nayak, S., Limsuwan, C., Chichurd, N., Kühlmann, K.-J., & Pungpang, S. (2017). Antimicrobial activity of analytes from *Bacillus pumilus* B2. *Aquaculture Research*, 48(11), 5606–5613. <https://doi.org/10.1111/are.13382>

Nour, I., Fattouh, F., & El-Adawi, H. (2015). Antibacterial bioactivity of lactic acid bacteria strains. *International Journal of Pharmacology*, 11(5), 440–447. <https://doi.org/10.3923/ijp.2015.440.447>

Osorio, V., Medina, R., Acuña, J. R., et al. (2023). Transformation of organic acids and sugars during prolonged fermentation. *Journal of Food Composition and Analysis*, 123, 105551. <https://doi.org/10.1016/j.jfca.2023.105551>

Pato, U., Riflyan, E., Jonnaidi, N. N., Wahyuni, M. S., Feruni, J. A., & Abdel-Wahhab, M. A. (2022). Antimicrobial efficacy of lactic acid bacteria and bacteriocin from dadih. *Food Science and Technology (Brazil)*, 42.

<https://doi.org/10.1590/fst.27121>

Pato, U., Riflyan, E., Jonnaidi, N. N., Wahyuni, M. S., Feruni, J. A., & Abdel-Wahhab, M. A. (2022). Isolation, Characterization, And Antimicrobial Evaluation Of Bacteriocin Produced By Lactic Acid Bacteria Against *Erwinia Carotovora*. *Food Science And Technology (Brazil)*, 42. <https://doi.org/10.1590/fst.11922>

Peng, Z., Wang, D., He, Y., et al. (2024). Gut distribution, impact factor, and action mechanism of bacteriocin-producing beneficial microbes. *Probiotics & Antimicrobial Proteins*, 16, 1516–1527. <https://doi.org/10.1007/s12602-024-10222-6>

Peng, Z., Xu, X., Fan, P., et al. (2023). A novel pH and heat stable bacteriocin-like substance lactococcin036019. *Food Control*, 148. <https://doi.org/10.1016/j.foodcont.2023.109682>

Peñuela-Martínez, A. E., Zapata-Zapata, A. E., & Durango-Restrepo, D. L. (2018). Performance of different fermentation methods and the effect on coffee quality. *Coffee Science*, 13(4), 465–476.

Pereira, L. L., Cardoso, W. S., Guarçoni, R. C., Da Fonseca, A. F. A., Moreira, T. R., & Caten, C. S. Ten. (2017). The Consistency In The Sensory Analysis Of Coffees Using Q-Graders. *European Food Research And Technology*, 243(9), 1545–1554. <https://doi.org/10.1007/s00217-017-2863-9>

Pereira, L. L., Guarçoni, R. C., Pinheiro, P. F., Osório, V. M., Pinheiro, C. A., Moreira, T. R., & Ten Caten, C. S. (2020). New Propositions About Coffee Wet Processing: Chemical And Sensory Perspectives. *Food Chemistry*, 310. <https://doi.org/10.1016/j.foodchem.2019.125943>

Pereira, L. L., Júnior, D. B., De Sousa, L. H. B. P., Dos Santos Gomes, W., Cardoso, W. S., Guarçoni, R. C., & Ten Caten, C. S. (2021). Relationship Between Coffee Processing And Fermentation. In *Food Engineering Series* (Pp. 255–301). Springer. https://doi.org/10.1007/978-3-030-54437-9_6



Perez, R. H., Zento, T., & Sonomoto, K. (2018). Circular and leaderless bacteriocins: Biosynthesis, mode of action, applications, and prospects. *Frontiers in Microbiology*, 9, 2085. <https://doi.org/10.3389/fmicb.2018.02085>

Poltronieri, P., & Rossi, F. (2016). Challenges In Specialty Coffee Processing And Quality Assurance. *Challenges*, 7(2), 19. <https://doi.org/10.3390/challe7020019>

Ponrasu, T., Huang, C.-W., & Cheng, Y.-S. (2020). Optimization Of Bacteriocin Production By Lactic Acid Bacteria From Spent Coffee Ground Hydrolysate 1 Optimization Of Bacteriocin Production By Lactic Acid Bacteria From Spent Coffee Ground Hydrolysate. *Journal Of Innovative Technolog*, 1, 1–8. [https://doi.org/10.29424/jit.202003_2\(1\).0001](https://doi.org/10.29424/jit.202003_2(1).0001)

Pothakos, V., De Vuyst, L., Zhang, S. J., De Bruyn, F., Verce, M., Torres, J., Callanan, M., Moccand, C., & Weckx, S. (2020). Temporal Shotgun Metagenomics Of An Ecuadorian Coffee Fermentation Process Highlights The Predominance Of Lactic Acid Bacteria. *Current Research In Biotechnology*, 2, 1–15. <https://doi.org/10.1016/j.crbiot.2020.02.001>

Quinto, E. J., Jiménez, P., Caro, I., Tejero, J., Mateo, J., & Girbés, T. (2014). Probiotic Lactic Acid Bacteria: A Review. *Food And Nutrition Sciences*, 05(18), 1765–1775. <https://doi.org/10.4236/fns.2014.518190>

Ribeiro, L. S., Ribeiro, D. E., Evangelista, S. R., Miguel, M. G. Da C. P., Pinheiro, A. C. M., Borém, F. M., & Schwan, R. F. (2017). Controlled Fermentation Of Semi-Dry Coffee (*Coffea Arabica*) Using Starter Cultures: A Sensory Perspective. *Lwt*, 82, 32–38. <https://doi.org/10.1016/j.lwt.2017.04.008>

Rizki, D., & Wijonarko, R. (2020). *Composite: Jurnal Ilmu Pertanian Karakter Agronomis Dan Fisiologis Tanaman Kopi Robusta (Coffea Canephora) Pada Dataran Tinggi Di Kecamatan Pejawaran Kab. Banjarnegara*. 02, 11–16. <http://ejournal.uicm-unbar.ac.id/index.php/composite>

Romário Gava Ferrão, Aymbiré Francisco Almeida Da Fonseca, Maria Amélia Gava Ferrão, & Lúcio Herzog De Muner. (2019). *Conilon Coffee* (3rd Ed.). Incaper.



Mikroba Pada Daun Mimba (*Azadirachta Indica* A. Juss) Sebagai Standarisasi Bahan Obat Herbal. *Indonesia Medicus Veterinus*, 9(2), 270–280. <https://doi.org/10.19087/Imv.2020.9.2.270>

Silva, C. C. G., Silva, S. P. M., & Ribeiro, S. C. (2018). Application Of Bacteriocins And Protective Cultures In Dairy Food Preservation. In *Frontiers In Microbiology* (Vol. 9, Issue Apr). Frontiers Media S.A. <https://doi.org/10.3389/fmicb.2018.00594>

Urip, S. K., Wardani, T. S., & Listyani, T. A. (2023). Perbandingan Aktivitas Antibiofilm Ekstrak Biji Kopi Hijau Dan Sangrai Kopi Robusta Terhadap *Staphylococcus Aureus*. *Publikasi Penelitian Terapan Dan Kebijakan*, 6(2), 172–181. <https://doi.org/10.46774/Pptk.V6i2.547>

Walker, G. M., & Stewart, G. G. (2016). *Saccharomyces Cerevisiae* In The Production Of Fermented Beverages. In *Beverages* (Vol. 2, Issue 4). Mdpi Ag. <https://doi.org/10.3390/Beverages2040030>

Wang, X., & Zhou, J. (2022). Response of foodborne pathogens to thermal processing. In T. Ding, X. Liao, & J. Feng (Eds.), *Stress responses of foodborne pathogens*. Springer. https://doi.org/10.1007/978-3-030-90578-1_2

Watanabe, D. (2024). Sake yeast symbiosis with lactic acid bacteria and alcoholic fermentation. *Bioscience, Biotechnology, and Biochemistry*, 88(3), 237–241. <https://doi.org/10.1093/bbb/zbad167>

Wibowo, N. A., Mangunwardoyo, W., Santoso, T. J., & Yasman. (2021). Effect Of Fermentation On Sensory Quality Of *Liberica* Coffee Beans Inoculated With Bacteria From Saliva *Arctictis Binturong* Raffles, 1821. *Biodiversitas*, 22(9), 3922–3928. <https://doi.org/10.13057/Biodiv/D220938>

Wigati, E. I., Pratiwi, E., Nissa, T. F., & Utami, N. F. (2019). Uji Karakteristik Fitokimia Dan Aktivitas Antioksidan Biji Kopi Robusta (*Coffea Canephora* Pierre) Dari Bogor, Bandung Dan Garut Dengan Metode Dpph (1,1-Diphenyl-2-



UNIVERSITAS
GADJAH MADA

PROFIL BAKTERIOSIN PUTATIF DAN KUALITAS KOPI ROBUSTA (*Coffea canephora* Pierre ex A Froehner) HASIL FERMENTASI KERING DENGAN KO-INOKULASI *Lactobacillus bulgaricus* dan *Saccharomyces cerevisiae*

Aryan Mustamin, Sari Darmasiwi, S.Si.,M.Biotech., Ph.D.

Universitas Gadjah Mada, 2026. Diunduh dari <http://etd.repository.ugm.ac.id>
Picryllyerzyp, P. *Jurnal Ilmiah*, 8(1), 53–59.

<https://doi.org/10.33751/Jf.V8i1.1172>

Wiyono. (2019). *Karakteristik Fisik Dan Kimia Kopi Rakyat*. Universitas Jember.

Zainal, Z. A., Hidayat, N., Rusmini, R., La Mudi, L. M., Dwi Mentari, F. S., Budi Arifiana, N., & Krismiratsih, F. (2025). Efektivitas bakteri asam laktat terhadap percepatan dekomposisi bahan organik mucuna dalam fermentasi kompos.

Median: Jurnal Ilmu-Ilmu Eksakta, 17(2), 50–60.

<https://doi.org/10.33506/md.v17i2.4562>

Zasari, M., Kartika, K., Darus Altin. (2023). Eksplorasi-Karakterisasi Morfologi Kopi Robusta Lokal Di Pulau Bangka. *Jurnal Agrikultura*, 2023(2), 200–209.