

DAFTAR PUSTAKA

- Amalia, D. (2025). *Modul ajar mikrobiologi*. Universitas Papua.
- Agustien, A., Muqarramah, M., & Alamsjah, F. (2024). Optimization and Molecular Identification of Protease-Producing Thermophilic Bacterial Isolate TUA-26. *OnLine Journal of Biological Sciences*, 24(3), 321–329. <https://doi.org/10.3844/ojbsci.2024.321.329>
- Bai, H., Wang, H., Sun, J., Irfan, M., Han, M., Huang, Y., Han, X., & Yang, Q. (2013). Production, purification and characterization of novel beta glucosidase from newly isolated *Penicillium simplicissimum* H-11 in submerged fermentation. *EXCLI journal*, 12, 528–540.
- Cardoso, S. J., Quadra, G. R., Resende, N. S., & Roland, F. (2019). The role of sediments in the carbon and pollutant cycles in aquatic ecosystems. *Acta Limnologica Brasiliensia*, 31, e201. <https://doi.org/10.1590/S2179-975X8918>
- Devinta, A., & Zulaika, E. (2021). Viability And Production Calcifying Bacterial Endospore On Sand-Cement Carrier . *Jurnal Ilmiah Biologi Eksperimen Dan Keanekaragaman Hayati (J-BEKH)*, 8(1), 8–13. <https://doi.org/10.23960/jbekh.v8i1.184>
- Fardiaz, S. (1992). *Mikrobiologi Pangan I*. Gramedia Pustaka Utama. Jakarta
- Florencio, C., Couri, S., & Farinas, C. S. (2012). Correlation between Agar Plate Screening and Solid-State Fermentation for the Prediction of Cellulase Production by *Trichoderma* Strains. *Enzyme research*, 2012, 793708. <https://doi.org/10.1155/2012/793708>
- Fouda, A., et al. (2024). Thermotolerant bacterial cellulase production and characterization. *Scientific Reports*. <https://doi.org/10.1038/s41598-024-51721-8>
- Francantika, Manja & Irdawati, Irdawati. (2025). Optimization of Starter Concentration of Thermophilic Bacteria Consortium from Mudiak Sapan to Produce Bioelectricity. *Jurnal Biologi Tropis*. 25. 1640-1645. <https://doi.org/10.29303/jbt.v25i2.8884>
- Gallo, G., Imbimbo, P., & Aulitto, M. (2024). The Undeniable Potential of Thermophiles in Industrial Processes. *International journal of molecular sciences*, 25(14), 7685. <https://doi.org/10.3390/ijms25147685>
- George, C., Lim, C. X. Q., Tong, Y., & Pointing, S. B. (2023). Community structure of thermophilic photosynthetic microbial mats and flocs at Sembawang Hot Spring, Singapore. *Frontiers in Microbiology*, 14, 1189468. <https://doi.org/10.3389/fmicb.2023.1189468>

- Golwalkar, Sucheta & Khatri, Farida. (2023). Enrichment and Characterisation of Cellulose Degrading Bacteria. *Defence Life Science Journal*. 8. 116-124. <https://doi.org/10.14429/dlsj.8.18061>
- Gómez-Gómez, L., & Boller, T. (2002). Flagellin perception: a paradigm for innate immunity. *Trends in plant science*, 7(6), 251–256. [https://doi.org/10.1016/s1360-1385\(02\)02261-6](https://doi.org/10.1016/s1360-1385(02)02261-6)
- Hanifa, N. I., Deccati, R. F., & Muliasari, H. (2021). Isolasi dan Uji Aktivitas Enzim Selulase dari Rumen Sapi (*Bibos javanicus*). *Journal of Science, Technology and Entrepreneur*, 3(1).
- Herwanda, Fadia & Linda, Tetty. (2025). Isolation and Characterization of Thermophilic Bacteria as Producing Enzyme Amylase from Kepanasan Hot Springs In Tapung Hulu, Kampar, Riau. *Jurnal Biologi Tropis*, 25(1), 967-974. <https://doi.org/10.29303/jbt.v25i1.7888>
- Hikam, A. R., Dewi, R. S., Mumpuni, A., Yulianti, D. M., & Setio, A. E. M. (2025). Aktivitas Selulase dan Pola Pertumbuhan Miselium *Aspergillus* RB1 (Fungi Selulolitik Asal TPST Rempoah, Banyumas) Berdasarkan Variasi Waktu Inkubasi. *BioEksakta: Jurnal Ilmiah Biologi Unsoed*, 7(4), 452-457.
- Hussian, C.H.A., Leong, W.Y. (2023). Thermostable enzyme research advances: a bibliometric analysis. *Journal of Genetic Engineering Biotechnology*, 21, 37. <https://doi.org/10.1186/s43141-023-00494-w>.
- Irdawati, I., & Putri, I., Syamsuardi, S., Agustien, & A., Rilda, Y. (2018). The Thermophilic Bacterial Growth Curve. *Bioscience*. 2. 58. <https://doi.org/10.24036/0201822100819-0-00>
- Jayasekara, S., & Ratnayake, R. (2019). Microbial Cellulases: An Overview and Applications. *IntechOpen*. <https://doi.org/10.5772/intechopen.84531>
- Johnsen, H. R., & Krause, K. (2014). Cellulase activity screening using pure carboxymethylcellulose: application to soluble cellulolytic samples and to plant tissue prints. *International journal of molecular sciences*, 15(1), 830–838. <https://doi.org/10.3390/ijms15010830>
- Kartika, I. N., & Ibrahim, M. (2021). Efek manipulasi pH pada aktivitas enzim selulase bakteri *Bacillus subtilis* strain FNCC 0059 dalam mendegradasi selulosa. *LenteraBio: Berkala Ilmiah Biologi*, 10(1), 51-57.
- Ketudat Cairns, J. R., & Esen, A. (2010). β -Glucosidases. *Cellular and molecular life sciences: CMLS*, 67(20), 3389–3405. <https://doi.org/10.1007/s00018-010-0399-2>
- Kumar, S. And R. Nussinov. (2001). How do Thermophilic Protein deals with heat?A review. *Cell and Molecular Life Science*, 58, 1216-1233.
- Lehninger, A. L. 1997. *Dasar-Dasar Biokimia*. Thenawidjaja M, penerjemah. Jakarta: Principle of Biochemistry

- Lestari, R., Nur, H., & Imaningsih, W. (2024). Karakterisasi Selulase Termotabil Asal Isolat Bakteri Tanah Pertanian Pasang Surut. *Bioscientiae*, 21(1), 41. <https://doi.org/10.20527/B.V21i1.12101>
- Lymar, E.S., B. Li and V. Renganathan. (1995). Purification and characterization of a cellulose-binding β -glucosidase from cellulose degrading culture of *Phanerochaete chrysosporium*. *Application and Environmental Microbiology*, 61, 2976-2980.
- Lynd, L. R., Weimer, P. J., van Zyl, W. H., & Pretorius, I. S. (2002). Microbial cellulose utilization: fundamentals and biotechnology. *Microbiology and Molecular Biology Reviews*, 66(3), 506–577. <https://doi.org/10.1128/MMBR.66.3.506-577.2002>.
- Madigan, M.T., J.M. Martinko, and J. Parker. (2009). *Biology of Microorganisms* (12th ed.). New York, NY: Prentice Hall International.
- Maghraby, Y. R., El-Shabasy, R. M., Ibrahim, A. H., & Azzazy, H. M. E. S. (2023). Enzyme Immobilization Technologies and Industrial Applications. In *ACS Omega*, 8(6), 5184–5196.
- Mahestri, Laras & Harpeni, Esti & Setyawan, Agus. (2021). Isolation and Screening of Amylolytic and Proteolytic Thermophilic Bacteria from Way Panas Hot Spring, Kalianda, South Lampung. *Jurnal Perikanan dan Kelautan*. 26(3). 161. <https://doi.org/10.31258/jpk.26.3.161-168>
- Majidah, R., Lubis, S. S., & Harahap, D. (2023). Potensi enzim selulase dari bakteri termofilik di kawasan Wisata Ie Suum Kabupaten Aceh Besar. *Kenanga: Journal of Biological Sciences and Applied Biology*, 3(1), 25-34.
- Mawati, Sefi & Harpen, Esti & Fidyandini, Hilma. (2021). Skrining Bakteri Termofilik Potensial Amilolitik Dari Sumber Air Panas Way Belerang Kalianda Lampung Selatan. *Journal of Aquatropica Asia*. 6. 1-7. <https://doi.org/10.33019/aquatropica.v6i1.2458>
- Mearls, E. B., et al. (2020). Sporulation in Bacteria: Beyond the Standard Model. *Microbiology Spectrum*, 8(2).
- Melati, I., Mulyasari, M., Sunarno, M. T. D., Bintang, M., & Kurniasih, T. (2014). Produksi Enzim Selulase Dari Bakteri TS2b Yang Diisolasi Dari Rumpun Laut Dan Pemanfaatannya Dalam Menghidrolisis Kulit Ubi Kayu Dan Daun Ubi Kayu Sebagai Bahan Baku Pakan Ikan Irama. *Jurnal Riset Akuakultur*, 9(2), 263-270.
- Murtiyaningsih, H., & Hazmi, M. (2017). Isolasi Dan Uji Aktivitas Enzim Selulase pada Bakteri Selulolitik Asal Tanah Sampah Isolation and Cellulase Enzyme Activities Assays in Cellulolytic Bacteria Origin From Soil Waste. *Agritop*, 15(2), 293-308.
- Muqarramah, M., Agustien, A., & Alamsjah, F. (2023). Isolation, Screening and Partial Characterization of Thermophilic Bacteria Producing Protease from Bukik

- Gadang Hot Springs, Solok Regency. *International Journal of Progressive Sciences and Technologies*, 40(1), 101-107.
<http://dx.doi.org/10.52155/ijpsat.v40.1.4521>
- Novanti, R., & Zulaika, E. 2018. Pola Pertumbuhan Bakteri Ureolitik pada Medium Calcium Carbonat Precipitation (CCP). *Jurnal Sains dan Seni ITS*, 7(2), 34-35,
<https://doi.org/10.12962/j23373520.v7i2.36187>
- Nurhayati, N., Aliyah, S. H., Jonesti, W. P., Mokodongan, R. S., Lunggani, A. T., Nafisa, A. R., Siregar, F. H., Putri, A. A., Kumalasari, D. P., Pasiana, A. D., Jannah, S. N., Sihotang, S. H., Kusdiyantini, E., Yulyani, S. R., Nurjannah, N. F., Pujiyanto, S., & Laksmi, F. A. (2026). *Enzim dan aplikasinya*. Heriviyatno Julika Siagian (Ed.). Perkumpulan Pendidikan dan Pelatihan Tenaga Kesehatan Progres Ilmiah Kesehatan.
- Oktari, Anita & Supriatin, Y & Kamal, M & Syafrullah, Haidir. (2017). The Bacterial Endospore Stain on Schaeffer Fulton using Variation of Methylene Blue Solution. *Journal of Physics: Conference Series*. 812. 012066.
<https://doi.org/10.1088/1742-6596/812/1/012066>
- Pahalagedara, A. S. N. W., & Gkogka, E. (2024). A review on spore-forming bacteria and moulds implicated in the quality and safety of thermally processed acid foods. *Food Control*, 166, 110716.
<https://doi.org/10.1016/j.foodcont.2024.110716>
- Pitri, R. E., Agustien, A., Febria, F. A. (2015). Isolasi dan karakterisasi bakteri amilomofilik dari sumber air panas Sungai Medang, *Jurnal Biologi Universitas Andalas* 4(2):119-122.
<https://doi.org/10.25077/jbioua.4.2.%25p.2015>
- Puspitasari, D., & Ibrahim, M. (2020). Optimasi aktivitas selulase ekstraseluler isolat bakteri eg 2 isolasi dari bungkil kelapa sawit (*Elaeis guineensis* jacq.). *LenteraBio: Berkala Ilmiah Biologi*, 9(1), 42-50
- Rahayu, A., G, Haryani, Y., & Puspita, F. (2014). Uji Aktivitas Selulolitik Dari Tiga Isolat Bakteri Bacillus SP. Galur Lokal Riau. *Jurnal Online Mahasiswa Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Riau*, 1(2).
- Rakhmawati, A., Yulianti, E., & Rohaeti, E. (2014). Seleksi Bakteri Termofilik Selulolitik Pasca Erupsi Merapi. *Jurnal Kaunia*, 10(2), 92-102.
- Rekadwad, B. N., Li, W. J., Gonzalez, J. M., Punchappady Devasya, R., Ananthapadmanabha Bhagwath, A., Urana, R., & Parwez, K. (2023). Ekstremofil: spesies yang berevolusi dan bertahan hidup dalam kondisi bermusuhan. *3 Biotek*, 13(9), 316. <https://doi.org/10.1007/s13205-023-03733-6>
- Runtuboi, Dirk & Gunaedi, Tri & Simonapendi, Maria & Pakpahan, Nadya. (2018). Isolasi dan Identifikasi Bakteri Termofilik dari Sumber Air Panas di Moso Distrik Muara Tami Kota Jayapura Provinsi Papua. *Jurnal Biologi Papua*.
<https://doi.org/10.68-73.10.31957/jbp.474>

- Sana, B. (2015). *Marine Microbial Enzymes: Current Status and Future Prospects*, in: *Springer Handbook of Marine Biotechnology*, Springer, 905-917. https://doi.org/10.1007/978-3-642-53971-8_38
- Sari, U. M., & Agustien, A. (2012). Penapisan dan karakterisasi bakteri selulolitik termofilik sumber air panas Sungai Medang, Kerinci, Jambi. *Jurnal Biologi UNAND*, 1(2).
- Sari, Y. E. S., Azizah, F., Tumbol, M. V. L., Prayekti, E., Nurbidayah, Wijayanti, D. R., Rohayati, Astuti, R. A. W., Fera, S., Situmeang, S. M. F., Inayah, M. N., Rini, C. S., Juniawan, M. F., Darmo, K. Dewi, Y. R., Sahroni, M., Sanatang, Patricia, V., Arimurti, A. R. R., & Dewi N. P. S. P. *Bakteriologi 1*. In: *Bakteriologi 1*. Cetakan Pertama, 1 . Pt. Media Pustaka Indo, Jawa Tengah, pp. 1-12. ISBN 978-634-7003-64-5
- Saropah, D. A., Jannah, A., & Maunatin, A. (2012). Kinetika reaksi enzimatis ekstrak kasar enzim selulase bakteri selulolitik hasil isolasi dari bekatul. *ALCHEMY: Journal of Chemistry*.
- Sayuti, I., Zulfarina, & Widodo, T. J. (2022). Influence of potential hydrogen (pH) on the growth of *Bacillus cereus* IMB-11 during hydrocarbon degradation in vitro. *Jurnal Pembelajaran dan Biologi Nukleus*, 8(3), 686–693. <https://doi.org/10.36987/jpbn.v8i3.3230>
- Septiana, L., Susanti, E., Haryani, Y., Rani, Z., & Rambe, R. (2024). Penapisan dan karakterisasi bakteri selulolitik termofilik. *Forte Journal*, 4(2), 472-480.
- Setyahadi, S., Bunasor T. K., & Hendarsyah, D. (2006). Karakterisasi Kitin Deasitilase Termotabil Isolat Bakteri asal Pancuran Tujuh Batu Raden Jawa Tengah. *Jurnal Teknologi dan Industri Pangan*. 17(1).
- Setyati, W. A., Martani, E., Triyanto, Subagiyo, Zainuddin, M. (2015). Growth kinetics and Protease Activity 36K Isolates Derived from Mangrove Ecosystem Sediment, Karimunjawa, Jepara (Kinetika Pertumbuhan dan Aktivitas Protease Isolat 36k Berasal dari Sedimen Ekosistem Mangrove, Karimunjawa, Jepara). *ILMU KELAUTAN: Indonesian Journal of Marine Sciences*. 20(3). 163. <https://doi.org/10.14710/ik.ijms.20.3.163-169>
- Setyoko, Heri & Utami, Budi. (2016). Isolasi dan Karakterisasi Enzim Selulase Cairan Rumen Sapi untuk Hidrolisis Biomassa Isolation and Characterization of Cellulase Enzymes Cow's Liquid Rumen for Biomass Hydrolysis. *Prosiding Seminar Nasional Pendidikan Biologi FKIP UNS*. 13. 2528-5742.
- Sholeha, Rofiqotus & Agustini, Rudiana. (2021). Lipase Biji-Bijian Dan Karakteristiknya. *Unesa Journal of Chemistry*. 10. 168-183. <https://doi.org/10.26740/ujc.v10n2.p168-183>
- Sholihati, A. M., Baharuddin, M., & Santi, S. (2015). Produksi dan Uji Aktivitas Enzim Selulase dari Bakteri *Bacillus subtilis*. *Al-Kimia*, 3(2), 78–90. <https://doi.org/10.24252/al-kimia.v3i2.1672>

- Shyaula, M., *et al.* (2023). Characterization of thermostable cellulase from *Bacillus licheniformis*. *International Journal of Microbiology*, 2023, 3615757. <https://doi.org/10.1155/2023/3615757>
- Simandjuntak S, Samuel MY. (2018). Isolation and Identification of Thermophilic Bacteria, Producer of Amylase Enzyme, from Lake Linow, North Sulawesi. *J Pure Appl Microbiol.* 12(2): 543-554. <https://doi.org/10.22207/JPAM.12.2.13>
- Suhartono, M. T. (1989). *Enzim Dan Bioteknologi*. Pusat Antar Universitas, Institut Pertanian Bogor, Bogor.
- Susanti, V.H. (2003). Isolasi Dan Karakterisasi Bakteri Termofilik Penghasil Enzim Protease. [Artikel]. Universitas Sebelas Maret, Surakarta.
- Teather, R. M. & Wood, P. J. (1982). Use of Congo Red-polysaccharide interactions in enumeration and characterization of cellulolytic bacteria from the bovine rumen. *Applied and Environmental Microbiology*, 43(4), 777–780.
- Utami, A. P., Setyaningsih, R., Pangastuti, A., & Lusi, S. (2019). Optimasi produksi enzim selulase dari jamur *Penicillium* sp. SLL06 yang diisolasi dari serasah daun salak (*Salacca edulis*). In *Prosiding Seminar Nasional Masyarakat Biodiversitas Indonesia* (Vol. 5, No. 2, pp. 145-149).
- Wahyuni, S. (2017). *Biokimia Enzim dan Karbohidrat*. Unimal Press.
- Wahyuni, R. T., Hayati, N., Novita, Y., & Fatmawati. (2025). Analisis potensi alam dan budaya Nagari Pariangan sebagai daya tarik kunjungan wisatawan. *Jurnal Penelitian Ilmiah Multidisipliner (JPIM)*, 2(4), 1635–1645.
- Waluyo, L. (2007). *Mikrobiologi Umum* (Edisi Revisi). Balai Pustaka: Jakarta
- Wibowo, R.L.M.S.A., Yuliatmo, R., Maryati, T., and Pahlawan, I., (2021). *Enzyme For Leather*. PT. Sepadan Putra Mandiri, Yogyakarta.
- Yıldız, S. Y. (2024). Isolation, identification and characterization of neopullulanase from *Thermomonas hydrothermalis* GKE 08. *Frontiers in Life Sciences and Related Technologies*, 5(2), 130. <https://doi.org/10.51753/flsrt.1447335>
- Yusuf, M. (2018). Bioinformatika, Solusi Pengembangan Produk Bioteknologi Di Indonesia: Studi Kasus Enzim Pada Vaksin. *Jurnal Pengabdian Kepada Masyarakat*, 2(6), 414-417.
- Zhao, X. Q., Zhang, X. Y., Zhang, F., Zhang, R., Jiang, B. J., & Bai, F. W. (2018). Metabolic engineering of fungal strains for efficient production of cellulolytic enzymes. In *Fungal Cellulolytic Enzymes: Microbial Production and Application* (pp. 27-41). Singapore: Springer Singapore.