

DAFTAR PUSTAKA

- Abou-Elela, G. M., Ibrahim, H. A. H., Hassan, S. W., Abd-Elnaby, H., & El-Toukhy, N. M. K. (2011). Alkaline protease production by alkaliphilic marine bacteria isolated from Marsa-Matrouh (Egypt) with special emphasis on *Bacillus cereus* purified protease. *African Journal of Biotechnology*, 10(22), 4631–4642. <https://doi.org/10.5897/AJB10.2111>
- Al-Harbi, N. A. 2012. Production and physical characterization of thermo-stable and organic solvents-tolerant protease from mesophilic *Bacillus* sp. NASK P6. *Biosciences Biotechnology Research Asia*, 9(1), 157–164. <https://doi.org/10.13005/bbra/976>
- Amrani, M.E., A. Debbab, A.H. Aly, V. Wray, S. Dobretsov, W.E.G. Muller, W. Lin, D. Lai and P. Proksch. (2012). Farinomalein Derivatives from an Unidentified Endophytic Fungus Isolated From The Mangrove Plant *Avicennia marina*. *Tetrahedron Letters*, 53.
- Akihary, C. V., & Kolondam, B. J. (2020). Utilization of the 16S rRNA gene as a bacterial identification device for research in Indonesia. *Pharmacon*, 9(1), 16–22.
- Arief, A. 2011. Pengaruh Suhu dan Salinitas Terhadap Viabilitas Bakteri *Aeromonas hydrophila* dan *Bacillus sp.*. Bogor: Institut Pertanian Bogor.
- Arzita & A. Agustien. 2013. Potensi *Bacillus* sp. PA-05 Termofilik Obligat Untuk Produksi Amilase. *Prosiding Semirata FMIPA Universitas Lampung*
- Asia, Latif. 2018. Ethyl Methane Sulfonate Chemical Mutagenesis of *Bacillus subtilis* for Enhanced Production of Protease. 5(3) doi: 10.19080/OMCIJ.2018.05.555664.
- Asker, M. M. S., Mahmoud, M. G., El Shebwy, K., & Abd el Aziz, M. S. 2013. Purification and characterization of two thermostable protease fractions from *Bacillus megaterium*. *Journal of Genetic Engineering and Biotechnology*, 11(2), 103–109. <https://doi.org/10.1016/j.jgeb.2013.08.001>

- Aznia, A., A. Agustien & N. Nasir. 2014. Optimasi Parsial Isolat Termofilik M5-24 dalam Produksi Protease. *Jurnal Biologi Universitas Andalas (J. Bio. UA.)* 3(3): 238-243.
- Badriyah, B. I., Ardyati, T., Mikrobiologi, L., Biologi, J., Brawijaya, U., Malang, J. V., & Timur, J. (2013). *Deteksi aktivitas proteolitik isolat bakteri asal ampas tahu pada substrat bekatul. 1(3).*
- Baehaki, Ace. Rinto. 2011. Isolasi dan Karakterisasi Protease dari Bakteri Tanah Indralaya, Sumatra Selatan. *Teknologi dan Industri Pangan. Vola XXII. No. 1.*
- Bei, A. (2021). *Mengenal Mangrove*. Balikpapan; Pusat Pengendalian Pembangunan Ekoregion Kalimantan(P3EK) Kementerian Lingkungan Hidup dan Kehutanan.
- Bengen, D. G., (2002). *Pedoman Teknis Pengenalan dan Pengelolaan Ekosistem Mangrove*. Pusat Kajian Sumberdaya Pesisir dan Lautan. IPB.
- Black, J.M. 2005. *Medical Surgical Nursing*. New York: Elsevier.
- Bohari, Nor Hidayah, and Noor Azlina Ibrahim. 2016. pHysical Optimization of Thermostable Alkaline Protease by E. Coli BL21 (DE3) Plyss Harboring 50A Protease Gene Using Response Surface Methodology. *Jurnal Teknologi* 78(1): 121–29.
- Buaben, Aaron O., and Ryan M. Pelis. 2023. Incubation Time Influences Organic Anion Transporter 1 Kinetics and Renal Clearance Predictions. *Journal of Xenobiotics* 13(2): 205–17.
- Cappuccino, J. G & N. Sherman. 2005. *Microbiology: a Laboratory Manual. 7th Ed.* Pearson Education, Inc. Publishing as Benjamin Cummings. San Francisco.
- Carballares, Diego, Javier Rocha-Martin, and Roberto Fernandez-Lafuente. 2022. The Stability of Dimeric D-Amino Acid Oxidase from Porcine Kidney Strongly Depends on the Buffer Nature and Concentration. *Catalysts* 12(9).
- Chen, Jingying., Gu, Yan. 2023. Optimization of fermentation conditions for protease production from *Bacillus subtilis*. BIO web of conferences, doi: 10.1051/bioconf/20235901006
- Cunha, E. N., de Souza, M. F. B., Lanza, D. C. F., & Lima, J. P. M. S. 2020. A low-cost smart system for electrophoresis-based nucleic acids detection at the visible spectrum. *PLoS One*, 15(10), e0240536.

- Damayanti, N. W. E., M. F. Abadi & N. W. D. Bintari. 2020. Perbedaan Jumlah Bakteri pada Wanita Lanjut Usia Berdasarkan Kultur Mikrobiologi Menggunakan Teknik Cawan Tuang dan Cawan Sebar. *Meditory : The Journal of Medical Laboratory*. 8(1). ISSN: 2338-1159.
- Dhillon, A., Sharma, K., Rajulapati, V., Goyal, A. (2018). *Current Developments in Biotechnology and Bioengineering Production, Isolation and Purification of Industrial Products*, Edition: 1, Chapter: 7, Publisher: Elsevier Radarweg. Amsterdam.
- Djamaan, A., A. Agustien & D. Yuni. 2012. Isolasi bakteri endofit dari tumbuhan surian (*Toona sureni* Blume Merr.) yang berpotensi sebagai penghasil antibakteri. *Jurnal Bahan Alam Indonesia*. 8(1).
- Dwidjoseputro, D. 2003. *Dasar - Dasar Mikrobiologi*. Djambatan. Jakarta. 214 hal.
- Dwitaviani, R. 2023. Pengaruh Sumber Karbon dan Nitrogen serta Konsentrasinya terhadap Produksi Protease beberapa Isolat Bakteri Endofitik *Sonneratia* Sp. dari Kawasan Mandeh, Pesisir Selatan. Skripsi. Universitas Andalas.
- Elisha, Mrabu, Jenoh., Mohamed, Traoré., Charles, Kosore., Nico, Koedam. 2021. Biochemical response of *Sonneratia alba* Sm. branches infested by a wood boring moth (Gazi Bay, Kenya). *Plos one*, doi: 10.1371/JOURNAL.PONE.0259261
- El-Sayed, G. N., Ignoffo, C. M., Leathers, T. D., & Gupta, S. C. 1993. Effects of cuticle source and concentration on expression of hydrolytic enzymes by an entomopathogenic fungus, *Nomuraea rileyi*. *Mycopathologia*, 122, 149-152.
- Enuneku, A. A. 2020. Interactions of trace metals with bacteria and fungi in selected agricultural soils of Egbema Kingdom, Warri North, Delta state, Nigeria', *Heliyon*, 6.
- Fardiaz, S. 1989. *Fisiologi Fermentasi*. Bogor. Pusat Antar Universitas. Institut Pertanian Bogor. Bogor
- Fitriana, Nur, and Mahanani Tri Asri. 2021. Aktivitas Proteolitik Pada Enzim Protease Dari Bakteri Rhizosphere Tanaman Kedelai (*Glycine Max L.*) Di Trenggalek. *LenteraBio : Berkala Ilmiah Biologi* 11(1): 144-52.
- Hamdiyati, Y. 2011. *Pertumbuhan dan Pengendalian Mikroorganism* II.file.upi.edu/Direktori/FPMIPA/JUR._PEND._BIOLOGI/196611031991012YANTI_HAMDIYATI/Pertumbuhan_pada_mikroorganism_II.pdf. 5 April 2023.

- Hartanti, Lilis. Yusiati Mira Lisa 2012. Karakterisasi Protease dan Isolat Bakteri Pendegradasi Tepung Bulu. Fakultas Pertanian Universitas Lambung Mangkurat Kalimantan Selatan
- Gado, JapHeth E., Gregg T. Beckham, and Christina M. Payne. 2020. Improving Enzyme Optimum Temperature Prediction with Resampling Strategies and Ensemble Learning. *Journal of Chemical Information and Modeling* 60(8): 4098–4107.
- Gault, Stewart, Peter M. Higgins, Charles S. Cockell, and Kaitlyn Gillies. 2021. A Meta-Analysis of the Activity, Stability, and Mutational Characteristics of Temperature-Adapted Enzymes. *Bioscience Reports* 41(4): 1–10.
- Ginting, E. L., L. Rangan., L. L. Wantania & S. Wullur. 2019. Isolasi Bakteri Symbion Alga Merah dari Perairan Tongkeina, Sulawesi Utara. *Jurnal Ilmiah Platax Fakultas Perikanan dan Ilmu Kelautan Universitas Sam Ratulangi*.7(2): 394-400.
- Haddar, A., N. Fakhfakh-Zouari, N. Hmidet, F. Frikha, M. Nasri, and A.S. Kamoun. 2010. Low-cost fermentation medium for alkaline protease production by *Bacillus mojavensis* A21 using hulled grain of wheat and sardinella peptone. *Journal of Science and Bioengineering*. 110 (3): 288–294.
- Hou, Qingzhen, Marianne Rooman, and Fabrizio Pucci. 2023. Enzyme Stability-Activity Trade-Off: New Insights from Protein Stability Weaknesses and Evolutionary Conservation. *Journal of Chemical Theory and Computation* 19(12): 3664–71.
- Isnaini, M. (2006). *Pertanian Organik*. Kreasi Wacana. Yogyakarta.
- Ischak. N, Yuszda K., Deasy N. 2017. Biokimia Dasar 1. Gorontalo; UNG Pres.
- Jayadev, A., & Jayadev, A. 2016. Screening and Isolation of Protease producing Marine Bacteria. *Emer Life Sci Res* (2016) 2(2): 73-76
- Liu, Yin. 2014. Optimization of Fermentation Conditions for Production of Neutral Protease by *Bacillus subtilis* 10075. Food Science,
- Liskova, Veronika et al. 2015. Balancing the Stability-Activity Trade-off by Fine-Tuning Dehalogenase Access Tunnels. *ChemCatChem* 7(4): 648–59.

- Jannah, R., Safika., M. Jalaluddin., Farida, & D. Aliza. 2017. Jumlah Koloni Bakteri Selulolitik pada Sekum Ayam Kampung (*Gallus domesticus*). *JIMVET*. 1(3). ISSN : 2540-9492.
- Junianto, Djumali M, Suprihatin, Mulyorini, Budiasih W. 2009. Pengaruh Tingkat Aerasi Dan Kecepatan Agitasi Terhadap Tingkat Hidrolisis Protein Kulit Udang Pada Tahapan Ekstraksi Kitin Secara Biologis. *Jurnal Bionatura*. 11(2): 107-117.
- Kartikawati, A. (2018). Potensi Bakteri Endofit Yang Diisolasi Dari Tanaman Jahe Merah Untuk Memacu Pertumbuhan Benih Lada. *Jurnal Buletin Penelitian Tanaman Rempah Dan Obat*, 29(1), 37–46.
- Khan MA, Ahmad N, Zafar AU, Nasir IA, Qadir MA. 2011. Isolation and screening of alkaline protease producing bacteria and pHysio-chemical characterization of the enzyme. *Afr J Biotech*;10:6203–12
- Kin, Onn, Chan., Stefan, Hertwig., D., Neokleous., Jana, M., Flury., Rafe, M., Brown. 2022. Widely used, short 16S rRNA mitochondrial gene fragments yield poor and erratic results in pHylogenetic estimation and species delimitation of ampHibians. *BMC ecology and evolution*, 22(1) doi: 10.1186/s12862-022-01994-y
- Kosim, M.S dan R. Putra. 2010. Pengaruh Suhu pada Protease dari *Bacillus subtilis*. Prosiding Skripsi Semester Genap 2009-2010. Jurusan Kimia FMIPA. ITS Surabaya.
- Kongkiattikajorn, J., Rodmui, A., & Dandusitapun, Y. (2007). Effect of agitation rate on batch fermentation of mixture culture of yeasts during ethanol production from mixed glucose and xylose. *Thailand Journal Biotechnoogyl*, 5, 1–4.
- Kumar, S., G. Stecher, M. Li, C. Knyaz dan K. Tamura. 2018. MEGA X: Molecular Evolutionary Genetics Analysis across computing platforms. *Molecular Biology and Evolution* 35: 1547-1549.
- Lestari, a, Anthoni A, Yetria R. 2013. Pengaruh Konsentrasi Inokulum Dan Induser Terhadap Produksi Protease Alkali *Bacillus* Sp. Isolat Mi.2.3 Termofilik. *Jurnal Biologika*. Vol. 2, No. 1, Tahun 2013
- Lobban, C.S., dan Harrison, P.J. 1987. Seaweed Ecology and pHysiology. Cambridge University Press.

- Madigan, M.T., J.M. Martinko, D. Stahl & Clark. (2012). *Brock Biology of Microorganisms (13th Edition)*. New York. Pearson.
- Mardalena, Mardalena. 2016. Fase Pertumbuhan Isolat Bakteri Asam Laktat (BAL) Tempoyak Asal Jambi Yang Disimpan Pada Suhu Kamar. *Jurnal Sain Peternakan Indonesia* 11(1): 58–66.
- Masson, Patrick, and Sofya Lushchekina. 2022. Conformational Stability and Denaturation Processes of Proteins Investigated by Electrophoresis under Extreme Conditions. *Molecules* 27(20).
- Melliawati, R., & Rahmani, N. 2016. Potensial Penghasil Enzim Protease Dari Taman Nasional Gunung Halimun. *Biopropal Industri*, 73–82.
- Motyán, J.A., F. Toth & J. Tozser. (2013). Research Applications of Proteolytic Enzymes in Molecular Biology. *Biomolecules* 3: 923-942.
- Moran L.A., K.G. Scrimgeour, H.R. Horton, R.S. Ochs & J.D. Rawn. (1994). *Biochemistry*. Second Edit, Prentice Hall, Inc. Upper Saddle River. *Biochemical Education* 22(4): 219.
- Nainggolan, J. 2009. Kajian Pertumbuhan Bakteri *Acetobacter sp.* Dalam Kombucha Rosela Merah (*Hibiscus Sabdariffa*) Pada Kadar Gula dan Lama Fermentasi Yang Berbeda. (Tesis). Universitas Sumatera Utara: Medan.
- Nontji, A. 1987. *Laut Nusantara*. Jakarta: Djambatan
- Noviyanti, T, and P Ardiningsih. 2013. Pengaruh Temperatur Terhadap Aktivitas Enzim Protease Dari Daun Sansakng (*Pycnarrhena Cauliflora* Diels). *Jurnal Kimia Khatulistiwa* 1(1): 1–6.
<http://jurnal.untan.ac.id/index.php/jkkmipa/article/view/990>.
- Nurkh Ntabo, R.M., Anthony, K.N., Wilber, L., James. K., James,N. 2018. Enzymatic Activity of EndopHytic Bacterial Isolates from Selected Mangrove Plants in Kenya. *The Open Microbiology Journal*, 12.
- Nurkhotimah, Evy Yuliati, and Anna Rahmawati. 2017. Pengaruh Suhu Dan pH Terhadap Aktivitas Enzim Fosfatase Bakteri Termofilik Sungai Gendol Pasca Erupsi Merapi. *Kingdom (The Journal of Biological Studies)* 6(8): 465–71.
- Nurhakiki & Pratiwi, W. N. 2018. Isolasi dan Karakterisasi Bakteri Asam Laktat dari Pepaya (*Carica papaya L.*). *Jurnal Biologi*. Universitas Riau.

- Nurtanny. 2018. Isolasi dan Skrining Bakteri Endofitik Tumbuhan Mangrove *Bruguiera gymnorrhiza* di Kuala Enok Indragiri Hilir, Riau Sebagai Penghasil Antibakteri. Tesis. Padang: Universitas Andalas.
- O. H. Lowry, N. J. Rosebrough, A. L. Farr, and R. J. Randall. 1951. Protein Measurement with the Folin pH enol Reagent,.
- Oktavia, Yulia, Shanti D., Susi L., Herpandi , & Miftahul J. 2018. Optimasi Waktu Inkubasi Produksi Protease Dan Amilase Isolat Bakteri Asal Terasi Ikan Teri *StolepHorus Sp. Jurnal Ilmu dan Teknologi Kelautan Tropis*. 10(3):19-725
- Panjaitan, F. J., T. Bachtiar., S. Arsyad., O. K. Lele. 2020. Isolation and Characteristics of pHospHate Solubilizing Bacteria (PSB) from Vegetative and Generative pHase of Maize RhizopHere. *Jurnal Agroplasma*, 7 (2) :53-60.
- Pimentel MR, Molina G, Dionísio AR, Roberto M. Junior M, Pastore GM. (2011). The use of endophytes to obtain bioactive compounds and their application in biotransformation process. *Biotechnology Research International*. 1:11.
- Pitshou, Bokoro., Wesley, Doorsamy. 2018. Contour Plots-Based Approach for Reliability Analysis of Small Data Sets of Varistor Arrester's Failure Times. doi: 10.1109/EEEIC.2018.8494614
- Poermono, A.T, Isnaeni, Sugianto, Djoko A.P, Ayu C.D, dan Digdo S. 2017. Pengaruh Nutrisi pada Produksi dan Karakterisasi Protease dari Bakteri Termofilik Isolat LS 1 Lumpur Sidoarjo. *Jurnal Farmasi Dan Ilmu Kefarmasian Indonesia* 4(2).
- Prabhavathy, G., M. Rajasekara, Pandian and B. Senthilkumar. (2013). Identification of Industrially Important Alkaline Protease Producing *Bacillus subtilis* by 16s rRNA Sequence Analysis and its Applications. *International Journal of Research in Pharmaceutical and Biomedical Sciences* 4: 332-338.
- Purohit, M. K., Rathore, D. S., Koladiya, G., Pandey, S., & Singh, S. P. 2022. Comparative analysis of the catalysis and stability of the native, recombinant and metagenomic alkaline proteases in organic solvents. *Environmental Science and Pollution Research*, 29(53), 80968-80982.
- Pursetyo, K. T., Tjahjaningsih, W., & Andriyono, S. 2013. Analisis Potensi *Sonneratia* sp. di Wilayah Pesisir Pantai Timur Surabaya Melalui Pendekatan

- Ekologi dan Sosial-Ekonomi [Potency Analysis Of *Sonneratia* sp. At East Coast Surabaya Through Ecology and Social Economy Studies]. *Jurnal Ilmiah Perikanan dan Kelautan*, 5(2), 129-138.
- Prieto, M. A., J. A. Vazquez, and M. A. Murado. 2015. A New and General Model to Describe, Characterize, Quantify and Classify the Interactive Effects of Temperature and pH on the Activity of Enzymes. *Analyst* 140(10): 3587–3602.
- Puspitasari, Dian, and Muslimin Ibrahim. 2021. Optimasi Aktivitas Selulase Ekstraseluler Isolat Bakter EG 2 Isolasi Dari Bungkil Kelapa Sawit (*Elaeis Guineensis* Jacq.). *LenteraBio : Berkala Ilmiah Biologi* 9(1): 42–50.
- Ramkumar, A., Sivakumar, N., Gujarathi, A. M., & Victor, R. 2018. Production of thermotolerant, detergent stable alkaline protease using the gut waste of *Sardinella longiceps* as a substrate: Optimization and characterization. *Scientific Reports*, 8(1), 1–15. <https://doi.org/10.1038/s41598-018-30155-9>
- Rao, Kiranmayee and M. Lakshmi Nasaru. 2007. Alkaline Protease from *Bacillus firmus* 7728. *African Journal of Biotechnology*. 6 , 21, 2493-2496.
- Riaz, A., Idrees, I., Ahmad, S., Siddiquiand, A., & Ul Qader, S. A. 2023. Enhanced Biosynthesis and Purification of Proteases from *Bacillus* sp. AI-5 by SmF: A Green Approach for Degradation of Peptide Bonds in Complex Proteins. *Journal of the Chemical Society of Pakistan*, 45(2), 128–135. <https://doi.org/10.52568/0012112/JCSP/45.02.2023>
- Reji M, and Ropak K., 2022. *Response surface methodology* (RSM): An overview to analyze multivariate data. *Indian Journal of Microbiology Research* 2022;9(4):241–248.
- Rinanda, T. (2011). Analisis sekuensing 16S rRNA di bidang mikrobiologi. *Jurnal Kedokteran Syiah Kuala*, 11, 172-177.
- Rori, C. A., Kandou, F. E. F., & Tangapo, A. M. 2020. Aktivitas Enzim Ekstraseluler dari Bakteri Endofit Tumbuhan Mangrove *Avicennia marina*. *Jurnal Bios Logos*, 11(2), 48. <https://doi.org/10.35799/jbl.11.2.2020.28338>
- Rozirwan, Muda, H. I., & Ulqodry, T. Z. (2020). Short communication: Antibacterial potential of actinomycetes isolated from mangrove sediment in Tanjung api-api, South Sumatra, Indonesia. *Biodiversitas*, 21(12), 5723–5728.

- Sandhya, C., Sumantha, A., Szakacs, G., & Pandey, A., 2005. Comparative evaluation of neutral protease production by *Aspergillus oryzae* in submerged and solid state fermentation. *Process Biochem.* 40:2689-2694.
- Sabbathini, G. C., & Pujiyanto, S. 2017. Isolasi dan identifikasi bakteri genus *SpHingomonas* dari daun padi (*Oryza sativa*) di area persawahan Cibinong. *Jurnal Akademika Biologi*, 6(1), 59-64.
- Saputri, A., L. Soesanto., E. Mugiastuti., A. Umayah & A. Sarjito. 2020. Eksplorasi dan Uji Virulensi Bakteri *Bacillus Sp.* Endofit Jagung Terhadap Penyakit Busuk Pelepah Jagung. *Jurnal Ilmu-ilmu Pertanian Indonesia*. 22(2).
- Setyati, W. A., Erni M., Triyanto T., Muhammad Z. 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):163-169.
- Sepriana, C., E. Sumiati., D. S. D. Jekti & L. Zulkifli. 2020. Identifikasi dan Uji Daya Hambat Isolat Bakteri Endofit Bunga Tanaman Cengkeh (*Syzygium aromaticum* L.) Terhadap Bakteri Patogen. *Jurnal Penelitian Pendidikan IPA*. 6(1).ISSN.2460- 2582.
- Setyawan, S. (2005). Pengaruh komposisi substrat, lama inkubasi dan pH dalam proses isolasi enzim xylanase dengan menggunakan media jerami padi. Skripsi. Jurusan Teknik Kimia Fakultas Teknik. Universitas Diponegoro, Semarang.
- Shuang, L., X. Yang, M. Zhu, and X., Wang. (2012). Technology Prospecting on Enzymes: Application, Marketing and Engineering. *Computational and Structural Biotechnology Journal*. 2 (3): 1-10.
- Sitio, S. 2008. Pengaruh Medan Listrik pada Media Pemeliharaan Bersalinitas 3 ppt Terhadap Tingkat Kelangsungan Hidup dan Pertumbuhan Ikan Gurame *Osprhonrmus gouramy* Lac. Skripsi. Bogor: Departemen Budidaya Perairan, Fakultas Perikanan dan Ilmu Kelautan, Institut Pertanian Bogor.
- Sperfeld, Martin, Delia A Narváez-barragán, Sergey Malitsky, and Veronica Frydman. 2024. "Reducing the Bacterial Lag pHase Through Methylated Compounds : Insights from Algal-Bacterial Interactions."
- Stanbury, P.F., Whitaker, A., Hall, S. J. 1995. *Principles of Fermentation Technology*. Oxford: Pergamon Press.

- Suberu, Y. I., Titilola S., Adekunle L., Ademola O.. 2019. Optimization of protease production in indigenous *Bacillus* species isolated from soil samples in Lagos, Nigeria using response surface methodology', *Biocatalysis and Agricultural Biotechnology*. 18:101011.
- Sudha, S. S. Usha Nandhini, V, Mathumathi, J. Monica Amala Nayaki. 2018. Production, optimization and partial purification of protease from terrestrial bacterium *Exiguobacterium profundum* sp. MM1', *Biocatalysis and Agricultural Biotechnology*. 16:347-352.
- Sunatmo, T. I. 2007. *Eksperimen Mikrobiologi Dalam Laboratorium*. Penerbit Ardy Agency, Bogor.
- Tamura, K., G. Stecher, D. Peterson, A. Filipski & S. Kumar. 2013. MEGA 6: Molecular Evolutionary Genetics Analysis Version 6.0. *Molecular Biology and Evolution* 30: 2725-2729.
- Tammu, A. I. P. P. 2023. Isolasi dan Karakterisasi Bakteri Endofit Jabon Merah (*Neolamarckia MacropHylla*) Sebagai Pemacu Pertumbuhan Tanaman Isolation and Characterization of Endofit Bacteries of Jabon Merah (*Neolamarckia macropHylla*) As Plant Growth Enhancers (Doctoral dissertation, Universitas Hasanuddin).
- Takami, H., Akiba, T. and Horikoshi, K. 1989. Production of extremely thermostable alkaline protease from *Bacillus* sp. no. AH-101. *Appl. Microbiol. Biotechnol.* 30, 120-124.
- Thakur, S., Sharma, N. K., Thakur, N., Savitri, & Bhalla, T. C. 2016. Organic solvent tolerant metallo protease of novel isolate *Serratia marcescens* PPB-26: production and characterization. 3 *Biotech*, 6(2). <https://doi.org/10.1007/s13205-016-0500-0>
- Van der Ent, Florian et al. 2023. Computational Design of the Temperature Optimum of an Enzyme Reaction. *Science Advances* 9(26): 1–9.
- Winarti, A., Fitriyanto, N. A., Pertiwinigrum, A., Bachruddin, Z., Pranoto, Y., & Erwanto, Y. 2018. Optimizing of protease purification from *Bacillus cereus* TD5B by ammonium sulfate precipitation. *Chemical Engineering Transactions*, 63, 709-714.
- Woese, C. R., Stackebrandt, R., Macke, T. J., & Fox, G. E. (1985). A phylogenetic definition of the major eubacterial taxa. *Syst. Appl. Microbiol*, 6, 143–151.

- Woo P.C.Y, Lau S.K.P, Teng J.L.L, Tse H, Yuen K.-Y. (2008). Then and now: use of 16SrDNA gene sequencing for bacterial identification and discovery of novel bacteria in clinical microbiology laboratories. *Clinical Microbiology and Infection*, 14(10).
- Wood, Janet M. 1999. Osmosensing by Bacteria: Signals and Membrane-Based Sensors. *Microbiology and Molecular Biology Reviews* 63(1): 230–62.
- Wulandari, D., & D. Purwaningsih. 2019. Identifikasi dan karakterisasi bakteri amilolitik pada umbi *Colocasia esculenta* L. secara morfologi, biokimia, dan molekuler. *Jurnal Bioteknologi dan Biosains Indonesia*, 6 (2), 247-258.
- Xiang, Chao, Yu Fei Ao, Matthias Höhne, and Uwe T. Bornscheuer. 2022. Shifting the pH Optima of (R)-Selective Transaminases by Protein Engineering. *International Journal of Molecular Sciences* 23(23).
- Xie, Xiaohong et al. 2019. Electrocatalytic Hydrogen Evolution in Neutral pH Solutions: Dual-pHase Synergy. *ACS Catalysis* 9(9): 8712–18.
- Yada, R. (2015). *Improving and Tailoring Enzymes for Food Quality and Functionality*. United Kingdom: Woodhead Publishin.
- Yin, Wang., Ling-Ling, Yue., Peng-Yun, Zeng., Chong-Yang, Wu., Ye, Han., Yihong, Song., Qianhui, Jin., Haoyun, Jiang., Ye, Chai. 2022. Prognostic Value of A New Risk Stratification Model (R2-ISS) in Newly Diagnosed Multiple Myeloma. *Journal of Experimental Hematology*, doi: 10.19746/j.cnki.issn.1009-2137.2022.06.023
- Yunita, E. 2012. *Isolasi dan Karakterisasi Bakteri Penghasil Enzim Protease dari Saluran Pencernaan Ikan Lele Dumbo (Clarias gariepinus) yang Berpotensi Sebagai Agen Bioprospek*. Skripsi. Universitas Islam Negeri Sultan Syarif Kasim Riau.
- Yusriah dan Kuswytasari, N.D. (2013). Pengaruh pH dan Suhu Terhadap Aktivitas Protease *Penicillium sp.* *Jurnal Sains Dan Seni Pomits*. 2(1).
- Zainuddin, M., Pringgenies, D., Radjasa, O. K., Haeruddin, H., Sabdaningsih, A., & Herawati, V. E. 2022a. Optimasi Kondisi Inkubasi Kultur (Suhu dan Agitasi) Terhadap Pertumbuhan dan Aktivitas Protease Ekstraseluler Bakteri *Bacillus*

firmus Asosiasi Sponge (Porifera: Demospongiae) dari Nusa Lembongan Bali Indonesia. *Journal of Marine Research*, 11(3), 547–556. <https://doi.org/10.14710/jmr.v11i3.35001>

Zainuddin, M., Pringgenies, D., Radjasa, O. K., Haeruddin, H., Sabdaningsih, A., & Herawati, V. E. 2022b. Optimasi pH Dan Salinitas Media Kultur Terhadap Pertumbuhan Dan Aktivitas Protease Ekstraseluler Bakteri *Bacillus Firmus* Dari Ekosistem Padang Lamun Nusa Lembongan – Bali. *Journal of Tropical Marine Science*, 5(2), 140–148. <https://doi.org/10.33019/jour.trop.mar.sci.v5i2.2862>

Zulfarina., Y. Rosiana., D. Ayudia & Darmawati. 2022. Isolasi Bakteri Endofit dari Tanaman Laban (*Vitex pubescens Vahl*) Sebagai Antibakteri. *Jurnal Sains dan Teknologi*. 11(1). ISSN: 2303- 3142.

Zusfahair, 2011. Amobilisasi Protease Dari *Bacillus* sp. BT 1 Menggunakan Poliakrilamida. *Jurnal molekul*, Vol 6 No 2.

