

## DAFTAR RUJUKAN

- Archana Lal, Naowarat Cheeptham. 2016. Starch Agar Protocol. *Starch Agar Protocol*. Online Web:  
[Http://Www.Microbelibrary.Org/Library/Laboratory-T](http://www.microbelibrary.org/library/laboratory-t).  
[Http://Www.Microbelibrary.Org/Library/Laboratory-Test/3780-Starch-Agar-Protocol](http://www.microbelibrary.org/library/laboratory-test/3780-starch-agar-protocol).
- Ardiwinata, A.N., 2020. Pemanfaatan Arang Aktif dalam Pengendalian Residu Pestisida di Tanah: Prospek dan Masalahnya. *Jurnal Sumberdaya Lahan*, 14(1), pp.49-62.
- Azzahra, Shafa Thalita *et al.* 2023. Synergism Each Isolates Of Thermophilic Bacteria SSA2, SSA3, SSA4, and SSAS6 In Xylanase Production.” *Jurnal Serambi Biologi* 8(2): 134–37.
- Basim, Yalda, *et al.* Biodegradation of Total Petroleum Hydrocarbons In Contaminated Soils Using Indigenous Bacterial Consortium. *Environmental Health Engineering and Management Journal* 7, No. 2 (2020): 127-133.
- Bhusal, Arjun, & Peter M Muriana. 2021. Isolation and Characterization of Nitrate Reducing Bacteria for Conversion of Vegetable-Derived Nitrate to Natural Nitrite. *Applied Microbiology*. 1(1), pp. 11–23.
- Buxton, R., 2011. Nitrate and nitrite reduction test protocols. *American Society for Microbiology*, pp.1-20.
- Chadijah, St, Maswati Baharuddin, And Firnanely Firnanely. 2019. Potensi Instrumen Ftir Dan Gc-MS Dalam Mengkarakterisasi Dan Membedakan Gelatin Lemak Ayam, Itik Dan Babi. *Al-Kimia* 7(2).
- Chen, Weiwei *et al.* 2020. Enhanced Biodegradation Of Crude Oil By Constructed Bacterial Consortium Comprising Salt-Tolerant Petroleum Degraders And Biosurfactant Producers. *International Biodeterioration And Biodegradation*.
- Cui, Jia Qi *et al.* 2020. Comparative Study On Different Remediation Strategies Applied In Petroleum-Contaminated Soils. *International Journal Of Environmental Research And Public Health* 17(5): 1–17.
- Curtis, Jeremy, Eric Metheny, and Shane R Sergent. 2023. *Hydrocarbon Toxicity*. Statpearls Publishing, Treasure Island (FL).
- Daris, Joshua, and Endah Retnaningrum. 2023. Bidegradasi Hidrokarbon Solar

Menggunakan Bakteri *Pseudomonas Aeruginosa* Dengan Bioreaktor Pieter Jhon Joshua Daris, Prof. Dr. Endah Retnaningrum, S.Si., M. Eng. ; Prof. Dr.Eng. Ir. Wahyu Wilopo, S.T., M.Eng.

Das, A., Das, N., *et. al.* 2024. Exploring the bioremediation potential of *Bacillus* spp. for sustainable mitigation of hydrocarbon contaminants. *Environmental Sustainability*, 7(2), pp.135-156.

Oludele, O. E. *et. al.* 2021. Bioremediation Of Crude Oil Contaminated Soil Using Cow Dung. *International Journal Of Sciences* 10(01): 29–34.

Elgazali, A., Althalb, H., Elmusrati, I., Ahmed, H.M. and Banat, I.M., 2023. Remediation Approaches to Reduce Hydrocarbon Contamination in Petroleum-Polluted Soil. *Microorganisms*, 11(10), p.2577.

Eze, M.O., Hose, G.C., George, S.C. and Daniel, R., 2021. Diversity and metagenome analysis of a hydrocarbon-degrading bacterial consortium from asphalt lakes located in Wietze, Germany. *AMB Express*, 11(1), p.89.

Fahrezi, I.A., Tunnisa, A.I., Yustriardi, M. and Azzahra, N., 2024. Analisis Perbandingan Ekspor Migas Indonesia. *EKOMA: Jurnal Ekonomi, Manajemen, Akuntansi*, 3(4), pp.938-945.

Gao, H., Wu, M., Liu, H., Xu, Y. & Liu, Z., 2022. Effect of Petroleum Hydrocarbon Pollution Levels On The Soil Microecosystem And Ecological Function. *Environmental Pollution*, 293, p.118511.

Van Hamme, J.D., Singh, A. & Ward, O.P., 2003. Recent Advances in Petroleum Microbiology. *Microbiology and molecular biology reviews*, 67(4), pp.503-549.

Hardianto, P, Y. S. Rahayu, & Y Yuliani. 2012. The Bioremediation As Solution Of Hydrocarbon Contaminated Soil (In Indonesian) Surabaya, Indonesia, Pp 22-30, February 25, 2012. *Proceedings Of The Chemical National Conference: 2012*.

Helmy, Qomarudin, & Edwan Kardena. 2024. Enhancing Field-Scale Bioremediation of Weathered Petroleum Oil-Contaminated Soil with Biocompost As A Bulking Agent. *Case Studies In Chemical And Environmental Engineering* 9(April).

Hossain, Forhad *et. al.* 2022. Saudi Journal Of Biological Sciences Bioremediation Potential Of Hydrocarbon Degrading Bacteria : Isolation, Characterization, and Assessment. *Saudi Journal Of Biological Sciences* (Xxxx): 0–5.

Ijah, U.J.J. and Safiyanu, H., 1997. Microbial degradation of Escravos light crude

oil in soil amended with chicken dropping and NPK fertilizer. In *10th Annual Conference of Biotechnology Society of Nigeria*.

- Jabbar, N.M., Alardhi, S.M., *et al.* 2022. Challenges in the Implementation Of Bioremediation Processes In Petroleum-Contaminated Soils: A Review. *Environmental Nanotechnology, Monitoring & Management*, 18, p.100694.
- Karamba, K.I. and Ahmad, S.A., 2019. Mathematical Relationship of Optical Density, Total Viable Count and Microbial Biomass For Growth of *Serratia Marcescens* Strain AQ07 On Cyanide. *Journal of Environmental Microbiology and Toxicology*, 7(1), pp.7-9.
- Khidr, R., Qurbani, K., Muhammed, V., *et al.* 2025. Synergistic Effects of Indigenous Bacterial Consortia on Heavy Metal Tolerance and Reduction. *Environmental Geochemistry and Health*, 47(3), p.79.
- Lalremruati, M. and Devi, A.S., 2023. Duration of Composting and Changes in Temperature, pH and C/N Ratio During Composting: A Review. *Agricultural Reviews*, 44(3), pp.350-356.
- Ławniczak, Łukasz *et al.* 2020. Microbial Degradation of Hydrocarbons—Basic Principles For Bioremediation: A Review. *Molecules* 25(4): 1–19.
- Lin, Chitsan, Nicholas Kiprotich Cheruiyot, *et al.* 2022. Composting And Its Application In Bioremediation Of Organic Contaminants. *Bioengineered* 13(1): 1073–89.
- Lin, T., Kuo, S., *et al.* 2023. Characterization of VOCs During Diesel Oil Composting Process. *Bioresource Technology Reports*, 22, p.101392.
- Liu, S., Sun, *et al.* 2022. Petroleum Spill Bioremediation by An Indigenous Constructed Bacterial Consortium in Marine Environments. *Ecotoxicology and Environmental Safety*, 241, p.113769.
- Lumiaa, L., Rabbenia, G., *et al.* 2020. Treatment of Contaminated Sediments by Bio-Slurry Reactors: Study on the Effect of Erythromycin Antibiotic. *CET Journal-Chemical Engineering Transactions*, 79.
- Maier, R.M. and Pepper, I.L., 2015. Bacterial Growth. In *Environmental Microbiology* (pp. 37-56). Academic Press.
- Massot, Francisco Et Al. 2022. Microbial Associations For Bioremediation. What Does ‘Microbial Consortia’ Mean?. *Applied Microbiology And Biotechnology* 106(7): 2283–2297.

- Mishra, P., Kiran, *et al.* 2023. New Insights Into The Bioremediation of Petroleum Contaminants: A Systematic Review. *Chemosphere*, 326, p.138391.
- Muthukumar, B., Surya, S., Sivakumar, K., AlSalhi, M.S., Rao, T.N., Devanesan, S., Arunkumar, P. and Rajasekar, A., 2023. Influence of Bioaugmentation in Crude Oil Contaminated Soil by Pseudomonas Species on The Removal of Total Petroleum Hydrocarbon. *Chemosphere*, 310, p.136826.
- Nwankwegu, Amechi, *et al.* 2017. Use Of Rice Husk As Bulking Agent In Bioremediation Of Automobile Gas Oil Impinged Agricultural Soil. *Soil And Sediment Contamination: An International Journal* 26(1): 96–114.
- Ojima, Yoshihiro, *et al.* 2012. Accumulation Of Pyruvate By Changing The Redox Status In Escherichia Coli. *Biotechnology Letters* 34(5): 889–93.
- Omenna, Emmanuel Chukwuma, *et al.* 2024. Bio-Augmentation And Bio-Stimulation With Kenaf Core Enhanced Bacterial Enzyme Activities During Bio-Degradation Of Petroleum Hydrocarbon In Polluted Soil. *Scientific Reports* 14(1): 1–13.
- Ossai, I.C., Ahmed, A., *et al.* 2020. Remediation of Soil and Water Contaminated With Petroleum Hydrocarbon: A review. *Environmental Technology & Innovation*, 17, p.100526.
- Qattan, S.Y., 2025. Harnessing Bacterial Consortia for Effective Bioremediation: Targeted Removal of Heavy Metals, Hydrocarbons, and Persistent Pollutants. *Environmental Sciences Europe*, 37(1), p.85.
- Qv, M., Bao, J., Wang, *et al.* 2024. Bentonite Addition Enhances The Biodegradation of Petroleum Pollutants And Bacterial Community Succession During The Aerobic Co-Composting of Waste Heavy Oil With Agricultural Wastes. *Journal of Hazardous Materials*, 462, p.132655.
- Rahayu, Yuni Sri, Yuliani, & Guntur Trimulyono. 2019. Isolation And Identification Of Hydrocarbon Degradation Bacteria And Phosphate Solubilizing Bacteria In Oil Contaminated Soil In Bojonegoro, East Java, Indonesia. *Indonesian Journal Of Science And Technology* 4(1): 134–47.
- Reiner, K., 2010. Catalase Test Protocol. *American Society for Microbiology*, 1(1), pp.1-9.
- Rifai, M.R., Widowati, H. and Sutanto, A., 2020. Uji Sinergis Konsorsia Bakteri Indigen Len Berkonsorsia Bakteri Tanah di Kebun Percobaan Universitas Muhammadiyah Metro untuk Penyusunan Panduan Praktikum Mikrobiologi. *Biolova*, 1(2), pp.87-95.

- Said, Muhammad *et al.* 2021. Production Of Methane As Bio-Fuel From Palm Oil Mill Effluent Using Anaerobic Consortium Bacteria. *Journal Of Cleaner Production*. 282, p. 124424.
- Sanyi, L., Mulia, Y.S. *et al.* 2020. Gambaran Morfologi *Plasmodium* Sp Pada Pewarnaan Giemsa Dengan Pengenceran Menggunakan Larutan Nacl 0, 9% Dan Air Mineral Morphological Description Of Plasmodium Sp On Gyemsa Staining With Dilution Using 0.9% Nacl Solution And Mineral Water (Doctoral Dissertation, Politeknik Kesehatan Kemenkes Bandung).
- Sari, Gina L, Yulinah Trihadiningrum, *et al.* 2019. Bioremediation Of Petroleum Hydrocarbons In Crude Oil Contaminated Soil From Wonocolo Public Oilfields Using Aerobic Composting With Yard Waste And Rumen Residue Amendments. *Journal Of Sustainable Development Of Energy, Water And Environmet System* 7(3): 482–92.
- Sari, G.L. and Trihadiningrum, Y., 2018. Petroleum Hydrocarbon Pollution In Soil and Surface Water by Public Oil Fields In Wonocolo Sub-District, Indonesia. *Journal of Ecological Engineering*, 19(2), pp.184-193.
- Sharma, K., Singh, V., Pandit, S., Thapa, B.S., Pant, K. and Tusher, T.R., 2022. Isolation of biosurfactant-producing bacteria and their Co-culture application in microbial fuel cell for simultaneous hydrocarbon degradation and power generation. *Sustainability*, 14(23), p.15638.
- Sharma, S. and Pandey, L.M., 2022. Biodegradation Kinetics Of Binary Mixture Of Hexadecane And Phenanthrene By The Bacterial Microconsortium. *Bioresource Technology*, 358, p.127408.
- Subula, Rachmi, Wirnangsi D Uno, & Aryati Abdul. 2022. Kajian Tentang Kualitas Kompos Yang Menggunakan Bioaktivator Em4 (Effective Microorganism) Dan Mol (Mikroorganisme Lokal) dari Keong Mas. *Jambura Edu Biosfer Journal* 4(2): 54–64.
- Truskewycz, A., Gundry, T.D., *et al.* 2019. Petroleum Hydrocarbon Contamination In Terrestrial Ecosystems—Fate and Microbial Responses. *Molecules*, 24(18), p.3400.
- Saeed, S.W.Z., Naseer, I., *et al.* 2023. Bacillus Strains with Catalase Enzyme Improve The Physiology and Growth of Rice (*Oryza sativa* L.). *Stresses*, 3(4), pp.736-748.
- Weber, Sabine, *et al.* 2001. Bacterial Populations Colonizing And Degrading Rice Straw In Anoxic Paddy Soil. *Applied And Environmental Microbiology* 67(3): 1318–27.

- Wu, B., Xiu, J., *et al.* 2023. Degradation of Crude Oil In A Co-Culture System of *Bacillus Subtilis* and *Pseudomonas Aeruginosa*. *Frontiers in Microbiology*, 14, p.1132831.
- Xie, Shiyu *et al.* 2023. Transformation Characteristics of Organic Matter and Phosphorus In Composting Processes of Agricultural Organic Waste: Research Trends. *Materials Science For Energy Technologies* 6: 331–42.
- Xu, Y.Y., Wei, F.D., *et al.* 2022. Characterization and Genomic Analysis of A Nitrate Reducing Bacterium From Shale Oil In The Ordos Basin And The Associated Biosurfactant Production. *Journal of Environmental Chemical Engineering*, 10(6), p.108776.
- Yang, B., Zhou, M., *et al.* 2023. Hydrocarbons Removal and Microbial Community Succession In Petroleum-Contaminated Soil Under Hydrogen Peroxide Treatment. *Environmental Science and Pollution Research*, 30(10), pp.27081-27091.
- Yousefi, K., Mohebbi, A. and Pichtel, J., 2021. Biodegradation of Weathered Petroleum Hydrocarbons Using Organic Waste Amendments. *Applied and Environmental Soil Science*, 2021(1), p.6620294.
- Zahari, N.Z., Tuah, P.M., *et al.* 2022. Microbial Growth Rate And Distribution of Doubling Time at Different Concentration of Oil Sludge Medium. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1022, No. 1, p. 012075). IOP Publishing.



UNIVERSITAS  
GADJAH MADA

**Pengaruh Penambahan Limbah Organik dan Ko-kultur Bakteri terhadap Degradasi Hidrokarbon Tanah**

**Tercemar dari Desa Wonocolo, Bojonegoro, Jawa Timur**

Annisa Elchamida, Prof. Dr. rer.nat. Andhika Puspito Nugroho, S.Si., M.Si ; Prof. Dr. Endah Retnaningrum, M.Eng.

Universitas Gadjah Mada, 2025 | Diunduh dari <http://etd.repository.ugm.ac.id/>