UNIVERSITAS
GADJAH MADA
Pemanfaatan Carbon Dots (CDs) untuk Induksi Produksi Metabolit Sekunder oleh Streptomyces sp. GMR22
Ani Fajar Dwi Sawitri, Prof. Ir. Jaka Widada, M.P., Ph.D.; Prof. Ir. Triwibowo Yuwono, Ph.D.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Anonim. 2019. International *Streptomyces* Project-2 Medium (ISP-2). https://actinobase.org/index.php/ISP2. Diakses pada 25 September 2024 pukul 09.00 WIB.

Ahmad, H. H., A. Nurdradjat, H. Johanes, and A. D. Hariyanto. 2022. The FTIR investigation to characterize of functional groups in bituminous coal. Rasayan Journal of Chemistry 15(3): 1772-1778.

Atchudan, R., T. N. J. I. Edison, K. R. Aseer, S. Perumai, N. Karthik, and Y. R. Lee. 2018. Highly fluorescent nitrogen-doped carbon dots derived from *Phyllanthus acidus* utilized as a fluorescent probe for label-free selective detection of Fe3+ ions, live cell imaging and fluorescent ink☆. Biosensors and Bioelectronics 99: 303-311.

Bhattacharjee, S. 2016. Review article: DLS and zeta potential – what they are and what they are not? Journal of Controlled Release 235: 337-351.

Cimpoiu, C. and T. Hodison. 1997. Mobile phase optimization in thin layer chromatography (TLC). Reviews in Analytical Chemistry-Tel Aviv then London 16: 299-322.

De Simeis, D. and S. Serra. 2021. *Actinomycetes*: a never-ending source of bioactive compouds – an overview on antibiotics production. Antibiotics 10,483.

Dukhin, A. S. and R. Xu. 2020. Zeta-potential measurements. In Characterization of Nanoparticles 213-224. Elsevier.

Dwitya, S. S., Y. H. Hsueh, S. S. S. Wang, and K. L. Lin. 2023. Ultrafine nitrogen-doped graphene quantum dot structure and antibacterial activities against *Bacillus subtilis* 3610. Materials Chemistry and Physics 295, 127135.

Errington, J. and L. T. V. D. Aart. 2020. Microbe Profile: Bacillus subtilis: model organism for cellular development, and industrial workhorse. Microbiology 166(5): 425-427.

Gheni, A. I. and A. H. Hasan. 2022. Antibacterial screening and analysis of *Streptomyces coelicolor* secondary metabolites. Journal of Pharmaceutical Research International 34(7B): 26-39.

Hahn-Deinstrop, E. 2007. Applied Thin-Layer Chromatography: Best Practice and Avoidance of Mistakes. 2nd Edition. Wiley-VCH Verlag GmbH & Co. KGaA.

Hofko, B., L. Porot., A. F. Cannone, L. Poulikakos, L. Huber, X. Lu, K. Mollenhauer, and H. Grothe. 2018. FTIR spectral analysis of bituminous binders: reproducibility and impact of ageing temperature. Materials and Structures 51(45).

UNIVERSITAS
GADJAH MADA
Pemanfaatan Carbon Dots (CDs) untuk Induksi Produksi Metabolit Sekunder oleh Streptomyces sp. GMR22
Ani Fajar Dwi Sawitri, Prof. Ir. Jaka Widada, M.P., Ph.D.; Prof. Ir. Triwibowo Yuwono, Ph.D.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hoskisson, P. A., F. B. Gómez, and D. E. Rozen. 2024. Review: phenotypic heterogeneity in *Streptomyces* colonies. Current Opinion in Microbiology 78: 102448.

Jacoby, R. P., A. Koprivova, and S. Kopriva. 2021. Review: pinpointing secondary metabolites that shape the composition and function of the plant microbiome. Journal of Experimental Botany 72(1): 57-69.

Javed, N. and D. M. O'Carroll. 2021. Long-term effects of impurities on the particle size and optical emission of carbon dots. Nanoscale Advances 3(1): 182-189.

Krishnaiah, P., R. Atchudan, S. Perumal, E. S. Salama, Y. R. Lee, and B. H. Jeon. 2022. Utilization of waste biomass of *Poa pratensis* for green synthesis of n-doped carbon dots and its application in detection of Mn^{2+} and $Fe3^{+}$. Chemosphere 286, 131764.

Komaki, H. 2023. Review: recent progress of reclassification of the Genus *Streptomyces*. Microorganisms 11: 831.

Koza, N. A., A. A. Adedayo, O. O. Babalola, and A. P. Kappo. 2022. Microorganisms in plant growth and development: roles in abiotic stress tolerance and secondary metabolites secretion. Review: micoorganisms 10, 1528.

Liu, H., X. Zhong, Q. Pan, Y. Zhang, W. Deng, G. Zou, H. Hou, and X. Ji. 2024. A review of carbon dots in synthesis strategy. Coordination Chemistry Reviews 498, 215468.

Matsuoka, M., J. Koga, and A. Miyahara. 2022. Synthesis of azo dyes and generation of dot matrix using thin-layer chromatography. Journal of Chemical Education 100(2): 869-874.

Melinda, Y. N., J. Widada, T. D. Wahyuningsih, R. Febriansah, E. Damayanti, and M. Mustofa. 2021. Metabologenomics approach to the discovery of novel compounds from *Streptomyces* sp. GMR22 as anti-SARS-CoV-2 drugs. Heliyon 7(2021) e08308.

Michelena, S. P., C. N. A. Gonzalez, O. B. A. Perez, R. P. Herrera, M. C. Gonzalez, R. A. Valdes, J. A. A. Valdes, M. G. Salas, and A. Ilyina. 2021. Application of *Streptomyces* antimicrobial compounds for the control of Phytopathogens. Frontiers in Sustainable Food Systems 5: 696518.

Muhsin, L. B. dan M. E. P. Ramandha. 2023. Ekstraksi jahe (*Zingiberis officinale*) dan uji pemisahan kromatografi lapis tipis (KLT). Biocity Journal of Pharmacy Bioscience and Clinical Community 1(2): 69-76.

Nguyen, C.T., D. Dhakal, V. T. T. Pham, H. T. Nguyen, and J. K. Sohng. 2020. Review: recent advances in strategies for activation and discovery/characterization of cryptic biosynthetic gene clusters in streptomyces. Microorganisms 8(616).

UNIVERSITAS
GADJAH MADA
Pemanfaatan Carbon Dots (CDs) untuk Induksi Produksi Metabolit Sekunder oleh Streptomyces sp. GMR22
Ani Fajar Dwi Sawitri, Prof. Ir. Jaka Widada, M.P., Ph.D.; Prof. Ir. Triwibowo Yuwono, Ph.D.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Nirwati, H., E. Damayanti, E. N. Sholikhah, M. Mustofa, and J. Widada. 2022. Soil-derived *Streptomyces* sp. GMR22 producing antibiofilm activity against *Candida albicans:* bioassay, untargeted LC-HRMS, and gene cluster analysis. Heliyon 8(4), e09333.

Olanrewaju, O. S. and O.O Babalola. 2019. *Streptomyces*: implications and interactions in plant growth promotion. Applied Microbiology and Biotechnology 103: 1179-1188.

Ouyang, B., Q. Zhong, P. Ouyang, Y. Yuan, X. Wu, S. T. Yang. 2024. Graphene quantum dots enhance the biological nitrogen fixation by up-regulation of cellular metabolism and electron transport. Chemical Engineering Journal 487, 150694.

Rajaram, S. K., P. Ahmad, S. S. S. Keerthana, P. J. Cressida, I. G. Moorthy, and R. S. S. Suresh. 2020. Extraction and purification of an antimicrobial bioactive element from lichen associated *Streptomyces olivaceus* LEP7 against wound inhabiting microbial pathogens. Journal of King Saud University-Science 32(3): 2009-2015.

Sari, F. D., Chotimah, Roto, and I. Kartini. 2023. Highly fluorescent nitrogen-doped graphene quantum dots (N-GQDS) synthesized from *Pennisetum purpureum* for selective and sensitive detection of Fe^{3+} ions. Material Research Express 10(7): 075603.

Selim, M. S. M., S. A. Abdelhamid, and S. S. Mohamed. 2021. Secondary metabolites and biodiversity of actinomycetes. Journal of Genetic Engineering and Biotechnology 19(72): 1-13.

Skoog, D. A., F. J. Holler, and T. A. Nieman. 1998. Principles of Instrumental Analysis. 5th Ed. Philadelphia: Saunders College Pub.

Sonowal, A., A. Bharali, T. Saikia, S. Kushari, M. Lahon, J. M. Kalita, N. Biswas, D. Laloo, and B. P. Sahu. 2024. *Citrus aurantifolia*-derived carbon quantum dots with red fluorescence emission for codelivery with curcumin as theranostic liposomes for lung cancer. Future Journal of Pharmaceutical Sciences 10: 116.

Szczepankowska, J., G. Khachatryan, K. Khachatryan, and M. Krystyjan. 2023. Review: carbon dots-types, obtaining and application in biotechnology and food technology. International Journal of Molecular Sciences 24, 14984.

Wang, B., H. Cai, G. I. N. Waterhouse, X. Qu, B. Yang, and S. Lu. 2022. Review: carbon dots in bioimaging, biosensing, and therapeutics: a comprehensive review. Small Science 2(6): 2200012.

Ye, H., B. Liu, J. Wang, C. Zhou, Z. Xiong, and L. Zhao. 2022. A hydrothermal method to generate carbon quantum dots from waste bones and their detection of laundry powder. Molecules 27,6479.

UNIVERSITAS
GADJAH MADA
Pemanfaatan Carbon Dots (CDs) untuk Induksi Produksi Metabolit Sekunder oleh Streptomyces sp. GMR22
Ani Fajar Dwi Sawitri, Prof. Ir. Jaka Widada, M.P., Ph.D.; Prof. Ir. Triwibowo Yuwono, Ph.D.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhao, T., K. Wang, F. Liu, S. Zhang, and S. H. Ho. 2025. Recent progress of tailoring valuable graphene quantum dots from biomass. Chinese Chemical Letters 36: 110321.