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DAFTAR PUSTAKA

Abd El-Dayem, G. A., A. H. Ramadan, and H. S. Ali. 2020. Prevalence of virulence factors and antibiotic resistance genes in shiga toxin-producing *Escherichia coli* isolated from quails. Assiut Vet. Med. J. 66(167): 84-99.

Anggita, M., W. Asmara, T. Untari, M. H. Wibowo, S. Artanto, O. Herawati, dan A. E. T. H. Wahyuni. 2021. Resistansi antibiotik bakteri dari ulas kloaka burung puyuh sehat. Jurnal Veteriner. 22(4): 508-514.

Badr, J. M., A. S. E. D. Metwali, A. I. Yoseif, and M. M. Arafa. 2006. Treatment trials of *Pseudomonas aeruginosa* infection in quails. Journal of Veterinary Medical Research. 16(1): 46-60.

Bengtsson-Palme, J., F. Boulund, J. Fick, E. Kristiansson, and D. J. Larsson. 2014. Shotgun metagenomics reveals a wide array of antibiotic resistance genes and mobile elements in a polluted lake in India. Frontiers in microbiology. 5: 648.

Blokesch, M. 2015. Protocols For Visualizing Horizontal Gene Transfer In Gram-Negative Bacteria Through Natural Competence. Springer Berlin, Heidelberg.

Bruijns, B., T. Hoekema, L. Oomens, R. Tiggelaar, and H. Gardeniers. 2022. Performance of spectrophotometric and fluorometric DNA quantification methods. Analytica. 3(3): 371-384.

Budiyanto, D., S. O. Madyowati, dan A. Kusyairi. 2022. Waktu henti antibotik chloramphenicol terhadap perubahan kadar residu pada ikan bandeng (*Chanos Chanos*). Rekayasa. 15(2): 137-142.

Chen, X., Z. He, J. Zhao, M. Liao, Y. Xue, J. Zhou, and C. Sun. 2022. Metagenomic analysis of bacterial communities and antibiotic resistance genes in Penaeus monodon biofloc-based aquaculture environments. Frontiers in Marine Science. 8: 762345.

Chi, W., Y. Zou, T. Qiu, W. Shi, L. Tang, M. Xu, and X. Luan. 2024. Horizontal gene transfer plays a crucial role in the development of antibiotic resistance in an antibiotic-free shrimp farming system. Journal of Hazardous Materials. 476: 135150.

Du, X., R. Sun, L. Zhang, Y. Liu, and X. Ai. 2024. Transcriptomic association analysis of the metabolic mechanism of sulfamethoxazole in channel catfish (*Ictalurus punctatus*). Animals. 14(7): 1059.

Dwinafiah, R., dan S. A. Z. Hasan. 2023. Optimalisasi produksi perikanan berkualitas berbasis digital yang aman, dan ramah lingkungan sebagai peningkatan ekonomi masyarakat pesisir. Riset Sains dan Teknologi Kelautan. 6(2): 141-146.

Fatoba, D. O., D. G. Amoako, A. L. K. Abia, and S. Y. Essack. 2022. Transmission of antibiotic-resistant *Escherichia coli* from chicken litter to agricultural soil. Frontiers in Environmental Science. 9: 751732.

UNIVERSITAS
GADJAH MADA
Deteksi Gen Resisten Antibiotik tetA, qnrS, sul1, ermB Pada Unit Budidaya Ikan dan Udang di Daerah Istimewa Yogyakarta dengan Multipleks PCR
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Frieri, M., L. Kumar, and A. Boutin. 2017. Antibiotic resistance. Journal of infection and public health. 10(4): 369-378.

Fyfe, C., T. H. Grossman, K. Kerstein, and J. Sutcliffe. 2016. Resistance to macrolide antibiotics in public health pathogens. Cold Spring Harbor perspectives in medicine. 6(10): a025395.

Grossman, T. H. 2016. Tetracycline antibiotics and resistance. Cold Spring Harbor perspectives in medicine. 6(4): a025387.

Gupta, A., H. Vlamakis, N. Shoemaker, and A. A. Salyers. 2003. A new Bacteroides conjugative transposon that carries an *ermB* gene. Applied and Environmental Microbiology. 69(11): 6455-6463.

Hadi, M. P., L. N. Fadlillah, M. Y. Widasmara, W. I. Muziasari, and S. Subaryono. 2018. Potensi sumber bakteri resisten antibiotik berdasarkan kondisi kualitas air dan penggunaan lahan di Sungai Code, Yogyakarta: suatu tinjauan metodologis. Jurnal Pengelolaan Lingkungan Berkelanjutan (*Journal of Environmental Sustainability Management*). 88-100.

Hernandez-Beltran, J. C. R., J. Rodríguez-Beltrán, O. B. Aguilar-Luviano, J. Velez-Santiago, O. Mondragón-Palomino, R. C. MacLean, and R. Peña-Miller. 2024. Plasmid-mediated phenotypic noise leads to transient antibiotic resistance in bacteria. Nature Communications. 15(1): 2610.

Hooper, D. C., and G. A. Jacoby. 2015. Mechanisms of drug resistance: quinolone resistance. Annals of the New York academy of sciences. 1354(1): 12-31.

Ikhrami, M. A. 2023. Deteksi Gen Resisten Antibiotik Pada Kegiatan Budidaya Perikanan di Sepanjang Saluran Irigasi Sapon Kabupaten Kulon Progo. Sekolah Pascasarjana. Universitas Gadjah Mada. Thesis.

Ikhrami, M. A., D. W. K. Sari, and M. M. P. Putra. 2024. Emergence of antibiotic resistance genes *sul1*, *teta*, *blages*, and *mexf* in sapon irrigation canal and aquaculture pond in Kulon Progo regency,Iindonesia. Journal of Ecological Engineering. 25(2): 85-92.

Jacoby, G. A., J. Strahilevitz, and D. C. Hooper. 2015. Plasmid-mediated quinolone resistance. Plasmids: Biology and Impact in Biotechnology and Discovery. 475-503.

Jagdmann, J., D. I. Andersson, and H. Nicoloff. 2022. Low levels of tetracyclines select for a mutation that prevents the evolution of high-level resistance to tigecycline. PLoS biology. 20(9): e3001808.

Kriss, M., K. Z. Hazleton, N M. Nusbacher, C. G. Martin, and C. A. Lozupone. 2018. Low diversity gut microbiota dysbiosis: drivers, functional implications and recovery. Current opinion in microbiology. (44): 34-40.

Kumar, G., E. Farrell, A. M. Reaume, J. A. Eble, and M. R. Gaither. 2022. One size does not fit all: Tuning eDNA protocols for high-and low-turbidity water sampling. Environmental DNA. 4(1): 167-180.

UNIVERSITAS
GADJAH MADA
Deteksi Gen Resisten Antibiotik tetA, qnrS, sul1, ermB Pada Unit Budidaya Ikan dan Udang di Daerah Istimewa Yogyakarta dengan Multipleks PCR
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Lastauskienė, E., V. Valskys, J. Stankevičiūtė, V. Kalcienė, V. Gėgžna, J. Kavoliūnas, and J. Armalyte. 2021. The impact of intensive fish farming on pond sediment microbiome and antibiotic resistance gene composition. Frontiers in veterinary science. 8: 673756.

Li, B., Y. Qiu, Y. Song, H. Lin, and H. Yin. 2019. Dissecting horizontal and vertical gene transfer of antibiotic resistance plasmid in bacterial community using microfluidics. Environment International. 131: 105007.

Li, S., C. Zhang, F. Li, T. Hua, Q. Zhou, S. H. Ho. 2021. Technologies towards antibiotic resistance genes (ARGs) removal from aquatic environment: a critical review. Journal of Hazardous Materials. 411: 125148.

Limbu, S. M., L. Q. Chen, M. L. Zhang, and Z. Y. Du. 2021. A global analysis on the systemic effects of antibiotics in cultured fish and their potential human health risk: a review. Reviews in Aquaculture. 13(2): 1015-1059.

Linayati, L., T. Y. Mardiana, M. B. Syakirin, B. D. Madusari, dan C. A. Purnama. 2024. Upaya pencegahan penyakit ikan di Desa Silirejo, Kecamatan Tirto Kabupaten Pekalongan. Jurnal Pengabdian kepada Masyarakat Radisi. 4(3): 71-77.

Liu, K., J. Han, S. Li, L. Liu, W. Lin, and J. Luo. 2019. Insight into the diversity of antibiotic resistance genes in the intestinal bacteria of shrimp *Penaeus vannamei* by culture-dependent and independent approaches. Ecotoxicology and environmental safety. 175: 451-459.

Liu, X., J. C. Steele, and X. Z. Meng. 2017. Usage, residue, and human health risk of antibiotics in Chinese aquaculture: A review. Environmental Pollution. 223: 161-169.

Lubis, D. S., dan S. Supriyanto. 2021. Uji kinerja alat thermalcycler dengan metode Polymerase chain reaction pada identifikasi Koi herpes virus pada ikan mas, *cyprinus carpio*. Buletin Teknik Litkayasa Akuakultur. 19(2): 133-135.

Lund, D., N. Kieffer, M. Parras-Moltó, S. Ebmeyer, F. Berglund, A. Johnning, and E. Kristiansson. 2022. Large-scale characterization of the macrolide resistome reveals high diversity and several new pathogen-associated genes. Microbial Genomics. 8(1): 000770.

Luturmas, A. 2014. Pemberian antibiotik inrofloxs terhadap kelulusan hidup benih ikan kerapu bebek *Cromileptes altivelis* yang terinfeksi bakteri *Vibrio alginolitycus*. Jurnal Triton. 10(2): 79-84.

Mahdizade Ari, M., K. J. Scholz, F. Cieplik, and A. Al-Ahmad. 2025. Viable but non-cultivable state in oral microbiota: a critical review of an underexplored microbial survival strategy. Frontiers in Cellular and Infection Microbiology. (15): 1533768.

Mawardi, M., A. Indrawati, A. M. Lusiastuti, and I. W. T. Wibawan. 2023. Antibiotic resistance gene-free probiont administration to tilapia for growth performance and *Streptococcus agalactiae* resistance. Veterinary World. 16(12): 2504.

UNIVERSITAS
GADJAH MADA
Deteksi Gen Resisten Antibiotik tetA, qnrS, sul1, ermB Pada Unit Budidaya Ikan dan Udang di Daerah Istimewa Yogyakarta dengan Multipleks PCR
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Milijasevic, M., S. Veskovic-Moracanin, J. Babic Milijasevic, J. Petrovic, and I. Nastasijevic. 2024. Antimicrobial resistance in aquaculture: risk mitigation within the one health context. Foods. 13(15): 2448.

Morshdy, A. E. M., M. A. Hussein, M. A. A. Mohamed, E. Hamed, A. E. El-Murr, and W. S. Darwish. 2022. Tetracycline residues in tilapia and catfish tissue and the effect of different cooking methods on oxytetracycline and doxycycline residues. Journal of Consumer Protection and Food Safety. 17(4): 387-393.

Murray, C. J., K. S. Ikuta, F. Sharara, L. Swetschinski, G. R. Aguilar, A. Gray, and N. Tasak. 2022. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. The lancet. 399(10325): 629-655.

Mustahal, M., D. Solihah, F. R. Indaryanto, and N. E. Putri. 2020. Determination Of Pharmacokinetics And Withdrawal Time Of Enrofloxacine Antibiotic On Catfish (*Clarias gariepinus*). Jurnal Perikanan dan Kelautan. 10(1): 66-75.

Muurinen, J., W. I. Muziasari, J. Hultman, K. Parnanen, V. Narita, C. Lyra, and M. P. Virta. 2022. Antibiotic resistomes and microbiomes in the surface water along the code river in Indonesia reflect drainage basin anthropogenic activities. Environmental science & technology. 56(21): 14994-15006.

Najah, A., I. W. Abida, dan D. W. Listiyarini. 2024. Analisis residu antibiotik furazolidone pada ikan dan udang di UPT Laboratorium Kesehatan Ikan dan Lingkungan Pasuruan, Jawa Timur. Juvenil: Jurnal Ilmiah Kelautan dan Perikanan. 5(4): 388-393.

Neri, V., L. Huang, and J. Li. 2021. Infections and Sepsis Development. London: IntechOpen.

Noer, S. 2021. Identifikasi bakteri secara molekular menggunakan 16S rRNA. EduBiologia: Biological Science and Education Journal. 1(1): 1-6.

Nuryady, M. M., H. Husamah, F. J. Miharja, I. Hindun, dan P. Patmawati. 2020. Desain dan optimasi primer gen pengkode MRPA *Trypanosoma evansi* dan penerapan pada pembelajaran biologi molekuler. Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika. 4(2): 223-233.

Park, Y. J., J. K. Lim, Y. J. Lee, and K. K. Kwon. 2025. Protocol for efficient recovery of high-quality DNA from microbiome of marine invertebrates. Journal of Microbiology. 63(9): jm-2507003.

Pavelquesi, S. L. S., A. C. A. de Oliveira Ferreira, A. R. M. Rodrigues, C. M. de Souza Silva, D. C. Orsi, and I. C. R. da Silva. 2021. Presence of tetracycline and sulfonamide resistance genes in *Salmonella* spp.: literature review. Antibiotics. 10(11): 1314.

Pawestri, W., G. D. Satria, N. Hakimah, and D. Yudhabuntara. 2019. Deteksi kejadian residu tetrasiklin pada daging ikan nila di Kota Yogyakarta dengan Kromatografi Cair Kinerja Tinggi (KCKT). Jurnal Sain Veteriner. 37(2): 185-192.

UNIVERSITAS
GADJAH MADA
Deteksi Gen Resisten Antibiotik tetA, qnrS, sul1, ermB Pada Unit Budidaya Ikan dan Udang di Daerah Istimewa Yogyakarta dengan Multipleks PCR
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Reda, R. M., R. E. Ibrahim, E. N. G. Ahmed, and Z. M. El-Bouhy. 2013. Effect of oxytetracycline and florfenicol as growth promoters on the health status of cultured Oreochromis niloticus. Egyptian Journal of Aquatic Research. 39(4): 241-248.

Redgrave, L. S., S. B. Sutton, M. A. Webber, and L. J. Piddock. 2014. Fluoroquinolone resistance: mechanisms, impact on bacteria, and role in evolutionary success. Trends in microbiology. 22(8): 438-445.

Shao, S., Y. Hu, J. Cheng, and Y. Chen. 2018. Research progress on distribution, migration, transformation of antibiotics and antibiotic resistance genes (ARGs) in aquatic environment. Critical reviews in biotechnology. 38(8): 1195-1208.

Shin, H., Y. Kim, S. Han, H. G. Hur. 2022. Resistome study in aquatic environments. Journal of Microbiology and Biotechnology. 33(3): 277.

Siahaan, S., M. J, Herman, and N. Fitri. 2022. Antimicrobial resistance situation in Indonesia: a challenge of multisector and global coordination. Journal of tropical medicine. 2022(1): 2783300.

Suzuki, S., and P. T. P. Hoa. 2012. Distribution of quinolones, sulfonamides, tetracyclines in aquatic environment and antibiotic resistance in Indochina. Frontiers in Microbiology. 3: 67.

Thibodeau, A. J., M. Barret, F. Mouchet, V. X. Nguyen, and E. Pinelli. 2024. The potential contribution of aquatic wildlife to antibiotic resistance dissemination in freshwater ecosystems: A review. Environmental Pollution. 350: 123894.

Venkatesan, M., M. Fruci, L. A. Verellen, T. Skarina, N. Mesa, R. Flick, C. Pham, R. Mahadevan, P. J. Stogios, and A. Savchenko. 2023. Molecular mechanism of plasmid-borne resistance to sulfonamide antibiotics. Nature Communications. 14(1): 4031.

Versmessen, N., L. Van Simaey, A. A. Negash, M. Vandekerckhove, P. Hulpiau, M. Vaneechoutte, and P. Cools. 2024. Comparison of DeNovix, NanoDrop and Qubit for DNA quantification and impurity detection of bacterial DNA extracts. PloS One. 19(6): e0305650.

Walsh, F., J. Willcock, and S. Amyes. 2003. High-level telithromycin resistance in laboratory-generated mutants of *Streptococcus pneumoniae*. Journal of Antimicrobial Chemotherapy. 52(3): 345-353.

Wang, Q., X. Zhou, Y. Liu, Q. Ding, Z. Wu, J. Deng, and L. Gao. 2022. Bacterial community and antibiotic resistance gene profiles of fish gut contents and their aquaculture environment in Tianjin, China. Aquaculture Journal. 2(4): 269-284.

WHO. 2015. Global Action Plan on Antimicrobial Resistance. 10(9): 354-355.

Wu, H. Y., D. Y. Shi, D. Yang, J. Yin, Z. W. Yang, Li, and M. Jin. 2020. Putative environmental levels of levofloxacin facilitate the dissemination of antibiotic-

UNIVERSITAS
GADJAH MADA
Deteksi Gen Resisten Antibiotik tetA, qnrS, sul1, ermB Pada Unit Budidaya Ikan dan Udang di Daerah Istimewa Yogyakarta dengan Multipleks PCR
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

resistant *Escherichia coli* via plasmid-mediated transformability. Ecotoxicology and Environmental Safety. 195: 110461.

Yang, X., C. Shen, S. Zhou, L. Jin, Y. Wang, and F. Yin. 2025. Quinolone resistance and prevalence of the related genes in *Photobacterium damselae* subsp. *damselae* recovered from diseased fish in Eastern China. Fishes. 10(6): 280.

Yasin, M. I. 2021. Determinasi residu antibiotik golongan tetracycline dan quinolone pada udang vaname (*Litopenaeus Vannamei*) di Kabupaten Polewali Mandar menggunakan high performance liquid chromatograph. Jurnal Ilmiah Maju. 4(1): 52-60.

Yuan, X. Y., X. T. Zhang, Y. T. Xia, Y. Q. Zhang, B. Wang, W. W. Ye, and H. Fei. 2021. Transcriptome and 16S rRNA analyses revealed differences in the responses of largemouth bass (*Micropterus salmoides*) to early *Aeromonas hydrophila* infection and immunization. Aquaculture. 541:736759.

Yuan, X., Z. Lv, Z. Zhang, Y. Han, Z. Liu, H. Zhang. 2023. A review of antibiotics, antibiotic resistant bacteria, and resistance genes in aquaculture: Occurrence, contamination, and transmission. Toxics. 11(5): 420.