

DAFTAR PUSTAKA

- Aboyadak, I. & N. G. Ali. 2024. Enrofloxacin, Effective treatment of *Pseudomonas aeruginosa* and *Enterococcus faecalis* infection in *Oreochromis niloticus*. *Microorganisms*. 12(5): 1-14.
- Agathokleous, E., Q. Wang, I. Iavicoli, & E. J. Calabrese. 2022. The relevance of hormesis at higher levels of biological organization: Hormesis in microorganisms. In *Current Opinion in Toxicology*. 29: 1-9.
- Almeida, A. R., M. Tação, J. Soares, I. Domingues, & I. Henriques. 2021. Tetracycline-Resistant Bacteria Selected from Water and Zebrafish after Antibiotic Exposure. *International Journal of Environmental Research and Public Health*. 18(6): 1-14.
- Andersson, D. I., & D. Hughes. 2014. Microbiological effects of sublethal levels of antibiotics. In *Nature Reviews Microbiology*. 12(7): 465–478.
- Aoki, T., T. Arai, & S. Egusa. 1977. Detection of R plasmids in naturally occurring fish-pathogenic bacteria, *Edwardsiella tarda*. *Microbiology and Immunology*. 21(2): 77-83.
- Arzanlou, M., W. C. Chai, & H. Venter. 2017. Intrinsic, adaptive and acquired antimicrobial resistance in Gram-negative bacteria. *Essays In Biochemistry*. 61(1): 49–59.
- Austin, B. & D. A. Austin. 2007. *Bacterial Fish Pathogens Disease of Farmed and Wild Fish*. 4thed. Praxis Publishing Ltd, Chichester, UK.
- Avendaño-Herrera, R., S. Núñez, J. L. Barja, & A. E. Toranzo. 2007. Evolution of drug resistance and minimum inhibitory concentration to enrofloxacin in *Tenacibaculum maritimum* strains isolated in fish farms. *Aquaculture International*. 16: 1–11
- Barman, A. K. A., M. M. Hossain, M. G. Rasul, B. C. Majumdar & M. M. Rahim. 2018. Effects of oxytetracycline residues in Thai Koi (*Anabas testudineus* Bloch) collected from Sylhet, Bangladesh. *Archives of Agriculture and Environmental Science*. 3(2): 174-179.
- Bentley, R. 2000. ChemInform Abstract: Mycophenolic Acid: A One Hundred Year Odyssey from Antibiotic to Immunosuppressant. *Chemical reviews*. 100(10): 3801-3825.
- Blanco, P., S. Hernando-Amado, J. A. Reales-Calderon, F. Corona, F. Lira, M. Alcalde-Rico, A. Bernardini, M. B. Sanchez, & J. L. Martinez. 2016. Bacterial multidrug efflux pumps: much more than antibiotic resistance determinants. *Microorganisms*. 4(14): 1-19.
- Calabrese, E. J., & E. Agathokleous. 2020. Theodosius Dobzhansky's view on biology and evolution vol 2.0: "Nothing in biology makes sense except in light of evolution and evolution's dependence on hormesis-mediated acquired resilience that

- optimizes biological performance and numerous diverse short and longer term protective strategies”. *Environment Research*. 186: 1-9.
- Calabrese, E. J. 2008. Hormesis: why it is important to toxicology and toxicologists. *Environment Toxicology and Chemistry*. 27(7): 1451–1474.
- Calabrese, E. J. & Baldwin L. A. 2002. Defining hormesis. *Human & Experimental Toxicology*. 21(2): 91–97.
- Calabrese, E. J., G. R. Hoffmann, E. J. Stanek, & M. A. Nascarella. 2010. Hormesis in high throughput screening of antibacterial compounds in *E. coli*. *Human & Experimental Toxicology*. 29(8): 667–677.
- Calabrese, E. J., & M. P. Mattson. 2017. How does hormesis impact biology, toxicology, and medicine?. *npj Aging and Mechanisms of Disease*. 3(13):1-8.
- Costa, S. S., M. Viveiros, L. Amaral, & I. Couto. 2013. Multidrug efflux pumps in *Staphylococcus aureus*: an update. *The open microbiology journal*. 7: 59-71.
- Cooke, C. L., R. S. Singer, S. S. Jang, & D. C. Hirsh. 2002. Enrofloxacin resistance in *Escherichia coli* isolated from dogs with urinary tract infections. *Journal of the American Veterinary Medical Association*. 220(2): 190-192
- Cox, G., & G. D. Wright. 2013. Intrinsic antibiotic resistance: Mechanisms, origins, challenges and solutions. *International Journal of Medical Microbiology*. 303(6-7): 287-292.
- Cross, A. S. 2008. What is a virulence factor?. *Crit Care*. 12(6): 196-197
- Dowling, A., J. O’ Dwyer, & C. C. Adley. 2017. Antibiotics: Mode of action and mechanisms of resistance. *In: A. Mendez-Vilas (Eds.) Antimicrobial research: Novel bioknowledge and educational programs*. Formatex Research Center, Badajoz, Spain, p: 536-545
- Dragosits, M. & D. Mattanovich. 2013. Adaptive laboratory evolution -- principles and applications for biotechnology. *Microbial cell factories*. 12(64):1-17.
- Ewing, W. H., A. C. McWhorter, M. R. Escobar & A. H. Lubin. 1965. *Edwardsiella*, a new genus of Enterobacteriaceae based on a new species, *E. tarda*. *International Bulletin of Bacteriological Nomenclature and Taxonomy*. 15(1):33-38.
- Fernández, L., E. B. M. Breidenstein, & R. E. W. Hancock. 2011. Creeping baselines and adaptive resistance to antibiotics. *Drug Resistance Updates*. 14(1): 1-21.
- Firma, R. R. Amalia, U. Sari, C. Chusbul, A. Amri & Siregar. 2012. Deteksi *Edwardsiella tarda* pada ikan lele (*Clarias* sp.) dengan metode *fluorescent antibody technique* (FAT). *Jurnal Akuakultur Indonesia*. 11(1): 96-102.

- Forsberg, K. J., S. Patel, T. A. Wencewicz, G. Dantas. 2015. The tetracycline destructases: A novel family of tetracycline inactivating enzymes. *Chemistry & Biology*. 22(7):888-897
- Galina, J., G. Yin, L. Ardó, Z. Jeney. 2009. The use of immunostimulating herbs in fish: an overview of research. *Fish Physiology and Biochemistry*. 35(4): 669–676.
- Goldstein, B. P. 2014. Resistance to rifampicin: a review. *The Journal of antibiotics*, 67(9): 625-630.
- Grabowski, Ł., L. Gaffke, K. Pierzynowska, Z. Cyske, M. Choszcz, G. Węgrzyn, & A. Węgrzyn. 2022. Enrofloxacin-The Ruthless Killer of Eukaryotic Cells or the Last Hope in the Fight against Bacterial Infections?. *International journal of molecular sciences*. 23(7): 1-22.
- Guo, R. X. & J. Q. Chen. 2012. Phytoplankton toxicity of the antibiotic chlortetracycline and its UV light degradation products. *Chemosphere*. 87(11): 1254–1259.
- Guz, L. & A. Kozińska. 2004. Antibiotic susceptibility of *Aeromonas hydrophila* and *A. sobria* isolated from farmed carp (*Cyprinus carpio* L.). *Bulletin of the Veterinary Institute in Puławy*. 48(4): 391–395.
- Harbarth, S., H. H. Balkhy, H. Goossens, V. Jarlier, J. Kluytmans, R. Laxminarayan, M. Saam, A. van Belkum, D. Pittet. 2015. Antimicrobial resistance: one world, one fight!. *Antimicrobial Resistance and Infection Control*. 4(49): 1-15
- Hawkey, P. M. 2003. Mechanisms of quinolone action and microbial response. *Journal of Antimicrobial Chemotherapy*. 51: 29-35.
- Hernando-Amado, S., P. Blanco, M. Alcalde-Rico, F. Corona, J. A. Reales-Calderón, M. B. Sánchez & J. L. Martínez. 2016. Multidrug efflux pumps as main players in intrinsic and acquired resistance to antimicrobials. *Drug Resistance Updates*. 28: 13-27.
- Hestianah, E. P., C. Anwar, S. Kuncorojakti, L. R. Yustinasari. 2014. *Buku Ajar Histologi Veteriner Jilid 2*. Departemen Anatomi Veteriner. Fakultas Kedokteran Hewan Universitas Airlangga. Surabaya.
- Hoffman, L.R., D. A. D'Argenio, M. J. MacCoss, Z. Zhang, R. A. Jones, S. I. Miller. 2005. Aminoglycoside antibiotics induce bacterial biofilm formation. *Nature*. 436(7054): 1171–1175.
- Holt, J. G., N. R. Krieg, P. H. A. Sneath, J. T. Stanley, & S. T. William. 1994. *Bergey's Manual of Determinative Bacteriology*. 9thed. Williams & Wilkins, Baltimore.
- Hooper, D. C., & G. A. Jacoby. 2016. Topoisomerase inhibitors: Fluoroquinolone mechanisms of action and resistance. *Cold Spring Harbor perspectives in medicine*. 6(9):1-21

- Hossain, M. M., K. Kawai, S. Oshima. 2011. Immunogenicity of Pressure Inactivated *Edwardsiella tarda* Bacterin to *Anguilla japonica* (Japanese Eel). *Pakistan Journal of Biological Science*. 14(15): 755–767.
- Iavicoli, I., L. Fontana, E. Agathokleous, C. Santocono, F. Russo, I. Vetrani, M. Fedele, & E. J. Calabrese. 2021. Hormetic dose responses induced by antibiotics in bacteria: A phantom menace to be thoroughly evaluated to address the environmental risk and tackle the antibiotic resistance phenomenon. *Science of the Total Environment*, 798: 1-17.
- Imai, Y., S. Sato, Y. Tanaka, K. Ochi, & T. Hosaka. 2015. Lincomycin at Subinhibitory Concentrations Potentiates Secondary Metabolite Production by *Streptomyces* spp. *Applied and environmental microbiology*. 81(11): 3869–3879.
- Jahn, L. J., C. Munck, M. M. H. Ellabaan, & M. O. A. Sommer. 2017. Adaptive laboratory evolution of antibiotic resistance using different selection regimes lead to similar phenotypes and genotypes. *Frontiers in Microbiology*. 8(816): 1-14.
- Kapoor, G., S. Saigal, & A. Elongavan. 2017. Action and resistance mechanisms of antibiotics: a guide for clinicians. *Journal of Anaesthesiology Clinical Pharmacology*. 33(3): 300-305.
- Keumalawati, L.T. 2016. Efek perendaman ekstrak *Spirulina platensis* terhadap hepatopankreas ikan gurame (*Osphronemus gouramy*) yang diinfeksi *Aeromonas hydrophilla*. Skripsi. Fakultas Kedokteran Hewan Universitas Airlangga. Surabaya.
- Kortright, K. E., B. K. Chan, J. L. Koff, & P. E. Turner. 2019. Phage Therapy: A Renewed Approach to Combat Antibiotic-Resistant Bacteria. *Cell host & microbe*. 25(2): 219–232.
- Kowalska-Krochmal, B. & R. Dudek-Wicher. 2021. The minimum inhibitory concentrations of antibiotics: methods, interpretation, clinical relevance. *Pathogens Journal*. 10(2):1-21.
- Kusmarwati, A., F. Andayani, & Y. Yenni. 2020. Prevalensi *Vibrio parahaemolyticus* pada Udang Vaname di Unit Pengolahan Ikan Jawa Tengah dan Jawa Timur. *J. P.B. Kelautan dan Perikanan*. 15(1): 21-31
- Kümmerer, K. 2009. Antibiotics in the aquatic environment – A review – Part I. *Chemosphere*. 75(4):417-434.
- Leal, J. F. E. B. H. Santos, & V. I. Esteves. 2018. *Oxytetracycline* in intensive aquaculture: water quality during and after its administration, environmental fate, toxicity and bacterial resistance. *Reviews in Aquaculture*. 11(4):1176–1194.
- Leung, K. Y., B. A. Siame, B. J. Tenkink, R. J. Noort, & Y. Mok. 2012. *Edwardsiella tarda* - Virulence mechanisms of an emerging gastroenteritis pathogen. *Microbes and Infection*. 14(1): 26-34.
- Lin, Z., Gen W., Jiayi W., Huazhong L., Fan Z., Xiaochen T., Jiming R. 2023. Toxicologic effect of short-term *enrofloxacin* exposure on brain of *Carassius auratus* var. Pengze. *Science of The Total Environment*. 869: 1-9

- Linares, J. F., I. Gustafsson, F. Baquero, & J. L. Martinez. 2006. Antibiotics as intermicrobial signaling agents instead of weapons. *Proceedings of the National Academy of Sciences of the United States of America*. 103(51): 19484–19489.
- Mai-Prochnow, A., A. B. Murphy, K. M. McLean, M. G. Kong, K. K. Ostrikov. 2014. Atmospheric pressure plasmas: infection control and bacterial responses. *International journal of antimicrobial agents*. 43(6): 508-517.
- Marr, A. K., J. Overhage, M. Bains, R. E. W. Hancock. 2007. The Lon protease of *Pseudomonas aeruginosa* is induced by aminoglycosides and is involved in biofilm formation and motility. *Microbiology*. 153(2): 474–482
- McPhearson, R. M., A. DePaola, S. R. Zywno, M. L. Motes Jr., A. M. Guarino. 1991. Antibiotic resistance in Gram negative bacteria from cultured catfish and aquaculture ponds. *Aquaculture*. 99(3):203–211.
- McPhee, J. B., S. Tamber, M. D. Brazas, S. Lewenza, dan R. Hancock. 2009. Antibiotic resistance due to reduced uptake. *In*: D. L. Mayers, S. A. Lerner, J. D. Sobel & M. Oullette (Eds.) *Antimicrobial Drug Resistance: Mechanisms of Drug Resistance*. Humana Press, New York, p: 97-110.
- Mhenni, N. B., G. Alberghini, V. Giaccone, A. Truant, & P. Catellani. 2023. Prevalence and Antibiotic Resistance Phenotypes of *Pseudomonas* spp. in Fresh Fish Fillets. *Foods*. 12(5): 1-12.
- Migliore, L., A. Rotini, M. C. Thaller. 2013. Low doses of tetracycline trigger the *E. coli* growth: a case of hormetic response. *Dose Response*. 11(4): 550–557.
- Motta, S. S, P. Cluzel, M. Aldana. 2015. Adaptive Resistance in Bacteria Requires Epigenetic Inheritance, Genetic Noise, and Cost of Efflux Pumps. *PLOS ONE*. 10(3):1-18
- Munita, J. M., & C. A. Arias. 2016. Mechanisms of Antibiotic Resistance. *Virulence Mechanisms of Bacterial Pathogens*. 4(2):1-24.
- Murugaiyan, J., P. A. Kumar, G. S. Rao, K. Iskandar, S. Hawser, J. P. Hays, Y. Mohsen, S. Adukkadukkam, W. A. Awuah, R. A. M. Jose, N. Sylvia, E. P. Nansbuga, B. Tilocca, P. Roncada, N. Roson-Calero, J. Moreno-Morales, R. Amin, B. K. Kumar, A. Kumar, A. Toufik, T. N. Zaw, O. O. Akinwotu, M. P. Satyaseela, M. B. M. van Dongen. 2022. Progress in alternative strategies to Combat Antimicrobial Resistance: Focus on Antibiotics. *Antibiotics (Basel, Switzerland)* 11(2): 1-37.
- Nadeem, S. F., U. F. Gohar, S. F. Tahir, H. Mukhtar, S. Pornpukdeewattana, P. Nukthamna, A. M. M. Ali, S. C. B. Bavisetty, S. Massa. 2020. Antimicrobial resistance: more than 70 years of war between humans and bacteria. *Critical Reviews in Microbiology*. 46(5): 578-599.
- Narwiyani, S. & K. Kurniasih. 2011. Perbandingan patogenesitas *Edwardsiella tarda* pada ikan mas koki (*Charassius auratus*) dan ikan celebes rainbow (*Telmatherina celebensis*). *Jurnal Riset Akuakultur*. 6(2):291-301.

- National Center for Biotechnology Information. 2023. PubChem Compound Summary for CID 71188, Enrofloxacin. Diakses 29 Oktober 2023 dari <https://pubchem.ncbi.nlm.nih.gov/compound/Enrofloxacin>
- Nikapitiya, C., H. P. S. U. Chandrarathna, S. H. S. Dananjaya, M. De Zoysa, J. Lee. 2020. Isolation and characterization of phage (ETP-1) specific to multidrug resistant pathogenic *Edwardsiella tarda* and its *in vivo* biocontrol efficacy in zebrafish (*Danio rerio*). *Biologicals*. 63: 14–23.
- Nonaka, L., I. Tadashi, S. Satoru. 2000. The Occurrence of *Oxytetracycline* Resistant Bacteria in the Fish Intestine and the Seawater Environment. *Microbes and Environments*. 15(4):223-228.
- Nucci, C., W. D. da Silveira, S. da Silva Corrêa, G. Nakazato, S. Y. Bando, M. A. Ribeiro, A. F. P. de Castro. 2002. Microbiological Comparative Study of Isolates of *Edwardsiella tarda* Isolated in Different Countries from Fish and Human. *Veterinary Microbiology*. 89(1) : 29–39.
- Pan, X. S. & L. M. Fisher. 1997. Targeting of DNA gyrase in *Streptococcus pneumoniae* by sparfloxacin: Selective targeting of gyrase or topoisomerase IV by quinolones. *Antimicrobial Agents Chemotherapy*. 41(2):471–474.
- Pandey, V., R. A. H. Bhat, S. Chandra, R. S. Tandel, M. K. Dubey, P. Sharma, B. Gehlot, P. Dash, R. Joshi. 2021. Clinical signs, lethal dose and histopathological lesions in grass carp, *Ctenopharyngodon idella* experimentally infected with *Edwardsiella tarda*. *Microbial Pathogenesis*. 161:1-9.
- Park, S. B., T. Aoki & T. S. Jung. 2012. Pathogenesis of and strategies for preventing *Edwardsiella tarda* infection in fish. *Veterinary Research*. 43(67):1-11.
- Pawestri, W., G. D. Satria, N. Hakimah, 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.
- Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 1/PERMEN KP/2019 tentang Obat Ikan.
- Perkasa, G., A. Nainggolan, Y. L. Dhewantara. 2019. Uji sensitivitas antibiotik terhadap bakteri *Aeromonas hydrophilla* dan *Edwardsiella tarda* skala laboratorium (*In Vitro*). *Jurnal Ilmiah Satya Minabahari*. 5(1):10-17
- Petković, T. Lukežič, & J. Šušković. 2017. Biosynthesis of *oxytetracycline* by *Streptomyces rimosus*: past, present and future directions in the development of *tetracycline* antibiotics. *Food Technology and Biotechnology*. 55(1): 3-13
- Plumb, J. A. & L. A. Hanson. 2011. Health maintenance and principal microbial diseases of cultured fishes. 3rded. Wiley-Blackwell, Ames.
- Post, G. 1987. Textbook of Fish Health. T.F.H. Publications Inc. 3137.

- Putri, A. K. M. 2023. Resistensi *Edwardsiella tarda* yang diisolasi dari lele (*Clarias* sp.) terhadap *erythromycin*, *oxytetracycline* dan *enrofloxacin*. Skripsi. Fakultas Pertanian, Universitas Gadjah Mada.
- Rahman, T., B. Yarnall, & D. A. Doyle. 2017. Efflux drug transporters at the forefront of antimicrobial resistance. *European Biophysics Journal*. 46(7): 647-653
- Reis, F. Y. T., V. P. Rocha, P. C. Janampa-Sarmiento, H. L. Costa, R. C. Egger, N. C. Passos, C. H. S. de Assis, S. P. Carneiro, A. F. Santos, B. A. Silva, F. A. Dorella, M. P. Leibowitz, R. K. Luz, F. Pierezan, S. U. Gallani, G. C. Tavares, H. C. P. Figueiredo. 2023. *Edwardsiella tarda* in Tambaqui (*Colossoma macropomum*): A Pathogenicity, Antimicrobial Susceptibility, and Genetic Analysis of Brazilian Isolates. *Animals*. 13(18): 1-14.
- Reygaert, W.C. 2018. An overview of the antimicrobial resistance mechanisms of bacteria. *AIMS Microbiology*. 4(3):482-501.
- Saikia, S. & P. Chetia. 2024. Antibiotics: From Mechanism of Action to Resistance and Beyond. *Indian Journal Microbiology*. 64(3): 821-845
- Serrano, P. H. 2005. Responsible Use of Antibiotics in Aquaculture. FAO Fisheries Technical Paper, Italy.
- Siedentop, B., V. N. Kachalov, C. Witzany, M. Egger, R. D. Kouyos, S. Bonhoeffer. 2024. The effect of combining antibiotics on resistance: A systematic review and meta-analysis. *medRxiv: the preprint server for health sciences*
- Tan, Y. P., J. Zheng, S. L. Tung, I. Rosenshine, K. Y. Leung. 2005. Role of type III secretion in *Edwardsiella tarda* virulence. *Microbiology*. 151: 2301–2313.
- Thanikachalam, K., K. Marimuthu, R. Xavier. 2010. Effect of garlic peel on growth, hematological parameters and disease resistance against *Aeromonas hydrophila* in African catfish *Clarias gariepinus* (Bloch) fingerlings. *Asian Pacific Journal of Tropical Medicine*. 3(8): 614-618
- Trouchon, T. & Lefebvre A. 2016. A review of enrofloxacin for veterinary use. *Open Journal Veterinary Medicine*. 6(2):40–58.
- Vancutsem, P. M., J. G. Babish, W. S. Schwark. 1990. The fluoroquinolone antimicrobials: structure, antimicrobial activity, pharmacokinetics, clinical use in domestic animals and toxicity. *The Cornell Veterinarian*. 80(2):173–186.
- Viel, A., A. Rostang, M. Morvan, C. Fournel, P. Daniel, C. Thorin, S. Baron, P. Sanders, S. Calvez. 2021. Population pharmacokinetics/pharmacodynamics modelling of *enrofloxacin* for the three major trout pathogens *Aeromonas salmonicida*, *Flavobacterium psychrophilum* and *Yersinia ruckeri*. *Aquaculture*. 545: 1-13
- Vinchhi, R., C. Jena, N. Matange. 2023. Adaptive laboratory evolution of antimicrobial resistance in bacteria for genetic and phenotypic analyses. *Star Protocols*. 4(1): 1-17.

- Volkers, G., G. J. Palm, M. S. Weiss, G. D. Wright, W. Hinrichs. 2011. Structural basis for a new tetracycline resistance mechanism relying on the TetX monooxygenase. *FEBS Letters*. 585(7):1061-1066.
- Wakabayashi, H. & S. Egusa. 1973. *Edwardsiella tarda* (*Paracolobactrum anguillimortiferum*) associated with pond-cultured eel diseases. *Bulletin of the Japanese Society of Scientific Fisheries*. 39: 931–936.
- Wang, C., Yong-Hua H., Heng C., Li S. 2013. The major fimbrial subunit protein of *Edwardsiella tarda*: vaccine potential, adjuvant effect, and involvement in host infection. *Fish & Shellfish Immunology*. 35(3):858-865.
- Wang, T., Dali W., Zhifen L., Qingqing A., Chunsheng Y., Qinghui H. 2016. Prediction of mixture toxicity from the hormesis of a single chemical: a case study of combinations of antibiotics and quorum-sensing inhibitors with gram-negative bacteria. *Chemosphere* 150: 159–167.
- Wessels, J. M. W. E. Ford, W. Szymczak, S. Schneider. 1998. The complexation of tetracycline and anhydrotetracycline with Mg^{2+} and Ca^{2+} : a spectroscopic study. *The Journal of Physical Chemistry B*. 102(46): 9323–9331.
- Wise, A. L., B. R. LaFrentz, A. M. Kelly, L. H. Khoo, T. Xu, M. R. Liles, T. J. Bruce. 2021. A Review of Bacterial Co-Infections in Farmed Catfish: Components, Diagnostics, and Treatment Directions. *Animals*. 11(11):1-17.
- Wistrand-Yuen, E., M. Knopp, K. Hjort, S. Koskiniemi, O. G. Berg, & D. I. Andersson. 2018. Evolution of high-level resistance during low-level antibiotic exposure. *Nature communications*. 9(1): 1-12.
- Woo, P. T. K., & D. W. Bruno. 2010. Fish diseases and disorders. Volume 3: viral, bacterial and fungal infections. *Edwardsiella septicaemias*. 512-534.
- Wyatt, L. E., Nickelson R. H. & Vanderzant C. 1979. *Edwardsiella tarda* In Freshwater Catfish and Their Environment. *Applied and environmental microbiology*. 38(4):710-714 .
- Xu, T. & Xiao-Hua Z. 2014. *Edwardsiella tarda*: An intriguing problem in aquaculture. *Aquaculture*. 431: 129–135.
- Yan, W., Yingjie Q., Jiangbo Q., Xiumei L., Zhang Q., Xubo W. 2021. The hsp40 Gene Family in Japanese Flounder: Identification, Phylogenetic Relationships, Molecular Evolution Analysis, and Expression Patterns. *Frontiers in Marine Science*. 7: 1-16.
- Zafran, S. Ismi, I. Mastuti, & K. Mahardika. 2020. Isolasi dan karakteristik bakteri yang diisolasi dari larva ikan kerapu hibrida cantik yang terserang penyakit ekor. *Journal of Fisheries and Marine Research*. 4(2): 194-200.
- Zhang, F., Wei C. 2022. The Mechanism of Bacterial Resistance and Potential Bacteriostatic Strategies. *Antibiotics*. 11(9):1-23



- Zhang, W., Jingxin W., Guangming Z., Yi Y., Xiping Z., Qi S., Yuanhao Y., Lisha M., Lichun L., Shugui L. 2021. Pharmacokinetics, tissue distribution, and depletion of *enrofloxacin* and its metabolite *ciprofloxacin* in the northern snakehead (*Channa argus*) following multiple oral administration. *Aquaculture*. 533:1-6
- Zheng, J., & Ka Y. L. 2007. Dissection of a type VI secretion system in *Edwardsiella tarda*. *Molecular Microbiology*. 66(5): 1192–1206.
- Zhu, F., Zongying Y., Yiliu Z., Kun H., Wenhong F. 2017. Transcriptome differences between enrofloxacin-resistant and enrofloxacin-susceptible strains of *Aeromonas hydrophila*. *PLoS One*. 12(7): 1-17.
- Zou, X., Zhifen L., Ziqing D., Daqiang Y. 2013. Novel approach to predicting hormetic effects of antibiotic mixtures on *Vibrio fischeri*. *Chemosphere*. 90: 2070–2076.