

DAFTAR PUSTAKA

- Aarab, N., Champeau, O., Mora, P., Daubeze, M., Garrigues, P., & Narbonne, J. F. (2004). Scoring approach based on fish biomarkers applied to French river monitoring. *Biomarkers*, 9(3), 258-270. <https://doi.org/10.1080/13547500400015626>
- Acharya, S., Rumi, S. S., Hu, Y., & Abidi, N. (2021). Microfibers from synthetic textiles as a major source of microplastics in the environment: A review. *Textile Research Journal*, 91(17–18), 2136–2156. <https://doi.org/10.1177/0040517521991244>
- Adji, B. K., Octodhiyanto, I., Rahmayanti, R., & Nugroho, A. P. (2022). Microplastic pollution in Rawa Jombor Reservoir, Klaten, Central Java, Indonesia: accumulation in aquatic fauna, heavy metal interactions, and health risk assessment. *Water, Air, & Soil Pollution*, 233(4), 112. <https://doi.org/10.1007/s11270-022-05572-2>
- Aebi, H. & Lester. (1984). [13] Catalase in Vitro. *Methods in Enzymology*, 105(C), 121–126. [https://doi.org/10.1016/S0076-6879\(84\)05016-3](https://doi.org/10.1016/S0076-6879(84)05016-3)
- Aguirre-Martínez, G. V., & Martín-Díaz, M. L. (2020). A multibiomarker approach to assess toxic effects of wastewater treatment plant effluents and activated defence mechanisms in marine (*Ruditapes philippinarum*) and fresh water (*Corbicula fluminea*) bivalve species. *Ecotoxicology*, 29(7), 941–958. <https://doi.org/10.1007/s10646-020-02216-1>
- Ahmed, M. K., Parvin, E., Islam, M. M., Akter, M. S., Khan, S., & Al-Mamun, M. H. (2014). Lead- and cadmium-induced histopathological changes in gill, kidney and liver tissue of freshwater climbing perch *Anabas testudineus* (Bloch, 1792). *Chemistry and Ecology*, 30(6), 532–540. <https://doi.org/10.1080/02757540.2014.889123>
- Alberghini, L., Truant, A., Santonicola, S., Colavita, G., & Giaccone, V. (2022). Microplastics in fish and fishery products and risks for human health: A review. *International journal of environmental research and public health*, 20(1), 789. <https://doi.org/10.3390/ijerph20010789>
- Alscher, R. G., Erturk, N., & Heath, L. S. (2002). Role of superoxide dismutases (SODs) in controlling oxidative stress in plants. *Journal of experimental botany*, 53(372), 1331-1341. <https://doi.org/10.1093/jexbot/53.372.1331>
- Ameur, W. B., de Lapuente, J., El Megdiche, Y., Barhoumi, B., Trabelsi, S., Camps, L., Serret, J., Ramos-Lopez, D., Gonzales-Linare, D., Dris, M.R., & Borràs, M. (2012). Oxidative stress, genotoxicity and histopathology biomarker responses in mullet (*Mugil cephalus*) and sea bass (*Dicentrarchus labrax*) liver from Bizerte Lagoon (Tunisia). *Marine pollution bulletin*, 64(2), 241-251. <https://doi.org/10.1016/j.marpolbul.2011.11.026>
- Azqueta, A., & Collins, A. R. (2013). The essential comet assay: a comprehensive guide to measuring DNA damage and repair. *Archives of toxicology*, 87, 949-968. <https://doi.org/10.1007/s00204-013-1070-0>
- Azqueta, A., Slyskova, J., Langie, S. A., O'Neill Gaivão, I., & Collins, A. (2014). Comet assay to measure DNA repair: approach and applications. *Frontiers in genetics*, 5, 103332. <https://doi.org/10.3389/fgene.2014.00288>
- Baalkhuyur, F. M., Bin Dohaish, E. J. A., Elhalwagy, M. E. A., Alikunhi, N. M., AlSuwailam, A. M., Røstad, A., Coker, D. J., Berumen, M. L., & Duarte, C. M. (2018). Microplastic in the gastrointestinal tract of fishes along the Saudi Arabian

- Red Sea coast. *Marine Pollution Bulletin*, 131, 407–415.
<https://doi.org/10.1016/j.marpolbul.2018.04.040>
- Balali-Mood, M., & Sadeghi, M. (2021). Toxic mechanisms of five heavy metals: mercury, lead, chromium, cadmium, and arsenic. *Frontiers in pharmacology*, 12, 643972. <https://doi.org/10.3389/fphar.2021.643972>
- Barboza, L. G. A., Cunha, S. C., Monteiro, C., Fernandes, J. O., & Guilhermino, L. (2020). Bisphenol A and its analogs in muscle and liver of fish from the North East Atlantic Ocean in relation to microplastic contamination. Exposure and risk to human consumers. *Journal of Hazardous Materials*, 393(December 2019), 122419. <https://doi.org/10.1016/j.jhazmat.2020.122419>
- Beliaeff, B., & Burgeot, T. (2002). Integrated biomarker response: a useful tool for ecological risk assessment. *Environmental Toxicology and Chemistry: An International Journal*, 21(6), 1316–1322. <https://doi.org/10.1002/etc.5620210629>
- Bera, K. K., Kumar, S., Paul, T., Prasad, K. P., Shukla, S. P., & Kumar, K. (2020). Triclosan induces immunosuppression and reduces survivability of striped catfish *Pangasianodon hypophthalmus* during the challenge to a fish pathogenic bacterium *Edwardsiella tarda*. *Environmental Research*, 186, 109575. <https://doi.org/10.1016/j.envres.2020.109575>
- Bessa, F., Barria, P., Neto, J. M., Frias, J. P., Otero, V., Sobral, P., & Marques, J. C. (2018). Occurrence of microplastics in commercial fish from a natural estuarine environment. *Marine pollution bulletin*, 128, 575–584. <https://doi.org/10.1016/j.marpolbul.2018.01.044>
- Bervoets, L., Knapen, D., De Jonge, M., Van Campenhout, K., & Blust, R. (2013). Differential Hepatic Metal and Metallothionein Levels in Three Feral Fish Species along a Metal Pollution Gradient. *PLoS ONE*, 8(3), 1–11. <https://doi.org/10.1371/journal.pone.0060805>
- Bhuyan, M. S. (2022). Effects of Microplastics on Fish and in Human Health. In *Frontiers in Environmental Science* (Vol. 10). Frontiers Media S.A. <https://doi.org/10.3389/fenvs.2022.827289>
- Bigot, A., Minguez, L., Giambérini, L., & Rodius, F. (2011). Early defense responses in the freshwater bivalve *Corbicula fluminea* exposed to copper and cadmium: Transcriptional and histochemical studies. *Environmental Toxicology*, 26(6), 623–632. <https://doi.org/10.1002/tox.20599>
- Bordós, G., Urbányi, B., Micsinai, A., Kriszt, B., Palotai, Z., Szabó, I., Hantosi, Z., & Szoboszlai, S. (2019). Identification of microplastics in fish ponds and natural freshwater environments of the Carpathian basin, Europe. *Chemosphere*, 216, 110–116. <https://doi.org/10.1016/j.chemosphere.2018.10.110>
- Browne, E., Charifou, R., Worku, Z. A., Babu, R. P., & Healy, A. M. (2019). Amorphous solid dispersions of ketoprofen and poly-vinyl polymers prepared via electrospraying and spray drying: A comparison of particle characteristics and performance. *International Journal of Pharmaceutics*, 566, 173–184. <https://doi.org/10.1016/j.ijpharm.2019.05.062>
- Capó, X., Morató, M., Alomar, C., Rios-Fuster, B., Valls, M., Compa, M., & Deudero, S. (2022). A biomarker approach as responses of bioindicator commercial fish species to microplastic ingestion: assessing tissue and biochemical relationships. *Biology*, 11(11), 1634. <https://doi.org/10.3390/biology11111634>
- Catherine, T., Vanessa, M., Evangelia, S., Valentina, C., Andreja, R., Rana, A. A., Carvalho, S., Serena, F., Alisa, K., Yiota, L., Ioannis, A., Andra, O., & Daniela, T.

- (2016). Biochemical biomarker responses to pollution in selected sentinel organisms across the Eastern Mediterranean and the Black Sea. *Environmental Science and Pollution Research*, 23, 1789-1804. <https://doi.org/10.1007/s11356-015-5410-x>
- Catteau, A., Bado-Nilles, A., Beaudouin, R., Tebby, C., Joachim, S., Palluel, O., Turies, C., Chretien, N., Nott, K., Ronkart, S., Geffard, A., & Porcher, J. M. (2021). Water quality of the Meuse watershed: assessment using a multi-biomarker approach with caged three-spined stickleback (*Gasterosteus aculeatus* L.). *Ecotoxicology and Environmental Safety*, 208, 111407. <https://doi.org/10.1016/j.ecoenv.2020.111407>
- Carvalho, C. dos S., Bernusso, V. A., Araújo, H. S. S. de, Espíndola, E. L. G., & Fernandes, M. N. (2012). Biomarker responses as indication of contaminant effects in *Oreochromis niloticus*. *Chemosphere*, 89(1), 60–69. <https://doi.org/10.1016/j.chemosphere.2012.04.013>
- Chamas, A., Moon, H., Zheng, J., Qiu, Y., Tabassum, T., Jang, J. H., Abu-Omar, M., Scott, S. L., & Suh, S. (2020). Degradation rates of plastics in the environment. *ACS Sustainable Chemistry & Engineering*, 8(9), 3494-3511.
- Clere, I. K., Ahmmed, F., Remoto, P. I. J. G., Fraser-Miller, S. J., Gordon, K. C., Komyakova, V., & Allan, B. J. M. (2022). Quantification and characterization of microplastics in commercial fish from southern New Zealand. *Marine Pollution Bulletin*, 184. <https://doi.org/10.1016/j.marpolbul.2022.114121>
- Cotelle, S., & Féraud, J. F. (1999). Comet assay in genetic ecotoxicology: A review. *Environmental and Molecular Mutagenesis*, 34(4), 246–255. [https://doi.org/10.1002/\(sici\)1098-2280\(1999\)34:4<246::aid-em4>3.3.co;2-m](https://doi.org/10.1002/(sici)1098-2280(1999)34:4<246::aid-em4>3.3.co;2-m)
- Dalozchio, T., Rodrigues, G. Z. P., Petry, I. E., Gehlen, G., & da Silva, L. B. (2016). The use of biomarkers to assess the health of aquatic ecosystems in Brazil: a review. In *International Aquatic Research* (Vol. 8, Issue 4, pp. 283–298). Springer Verlag. <https://doi.org/10.1007/s40071-016-0147-9>
- Dang, Z., Lock, R. A. C., Flik, G., & Wendelaar Bonga, S. E. (1999). Metallothionein response in gills of *Oreochromis mossambicus* exposed to copper in fresh water. *American Journal of Physiology - Regulatory Integrative and Comparative Physiology*, 277(1), 46-1), 320–331. <https://doi.org/10.1152/ajpregu.1999.277.1.r320>
- Dehaut, A., Cassone, A. L., Frère, L., Hermabessiere, L., Himber, C., Rinnert, E., Rivière, G., Lambert, C., Soudant, P., Huvet, A., Duflos, G., & Paul-Pont, I. (2016). Microplastics in seafood: Benchmark protocol for their extraction and characterization. *Environmental Pollution*, 215, 223–233. <https://doi.org/10.1016/j.envpol.2016.05.018>
- Delahaut, V., Daelemans, O., Sinha, A. K., De Boeck, G., & Bervoets, L. (2019). A multibiomarker approach for evaluating environmental contamination: Common carp (*Cyprinus carpio*) transplanted along a gradient of metal pollution. *Science of the total environment*, 669, 481-492. <https://doi.org/10.1016/j.foodchem.2018.08.095>
- Dutta, H. M., & Arends, D. A. (2003). Effects of endosulfan on brain acetylcholinesterase activity in juvenile bluegill sunfish. *Environmental Research*, 91(3), 157–162. [https://doi.org/10.1016/S0013-9351\(02\)00062-2](https://doi.org/10.1016/S0013-9351(02)00062-2)
- El-Agri, A. M., Emam, M. A., Gaber, H. S., Hassan, E. A., & Hamdy, S. M. (2022). Integrated use of biomarkers to assess the impact of heavy metal pollution on *Solea*

- aegyptiaca* fish in Lake Qarun. *Environmental Sciences Europe*, 34(1), 74. <https://doi.org/10.1186/s12302-022-00656-6>
- El-Khayat, H. M. M., Taleb, H. M. A., Helal, N. S., & Ghoname, S. I. (2020). Assessment of metallothionein expression in biomphalaria alexandrina snails and oreochromis niloticus fish as a biomarker for water pollution with heavy metals. *Egyptian Journal of Aquatic Biology and Fisheries*, 24(2), 209–223. <https://doi.org/10.21608/ejabf.2020.80032>
- Ellman, G. L., Courtney, K. D., Andres Jr, V., & Featherstone, R. M. (1961). A new and rapid colorimetric determination of acetylcholinesterase activity. *Biochemical pharmacology*, 7(2), 88-95. [https://doi.org/10.1016/0006-2952\(61\)90145-9](https://doi.org/10.1016/0006-2952(61)90145-9)
- Emon, F. J., Rohani, M. F., Sumaiya, N., Tuj Jannat, M. F., Akter, Y., Shahjahan, M., Kari, Z. A., Tahiluddin, A. B. & Goh, K. W. (2023). Bioaccumulation and bioremediation of heavy metals in fishes—A review. *Toxics*, 11(6), 510. <https://doi.org/10.3390/toxics11060510>
- Erbes, M., Erbes, M., Webler, A., We, A., Obst, U., Obst, U., Wild, A., & Wild, A. (1997). Detection of Primary DNA Damage in. *Environmental and Molecular Mutagenesis*, 458(April), 448–458.
- Fadlillah, L. N., Utami, S., Rachmawati, A. A., Jayanto, G. D., & Widyastuti, M. (2023). Ecological risk and source identifications of heavy metals contamination in the water and surface sediments from anthropogenic impacts of urban river, Indonesia. *Heliyon*, 9(4). <https://doi.org/10.1016/j.heliyon.2023.e15485>
- Ferdous, S. R., Amin, A., Hasan, J., Alam, M. S., & Shahjahan, M. (2023). Prevalence of microplastics in commonly consumed fish species of the river Old Brahmaputra, Bangladesh. *Environmental Science and Pollution Research*, 30(36), 85639–85654. <https://doi.org/10.1007/s11356-023-28514-9>
- Focke, F., Schuermann, D., Kuster, N., & Schär, P. (2010). DNA fragmentation in human fibroblasts under extremely low frequency electromagnetic field exposure. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis*, 683(1-2), 74-83. <https://doi.org/10.1016/j.mrfmmm.2009.10.012>
- Fonseca, V. F., França, S., Vasconcelos, R. P., Serafim, A., Company, R., Lopes, B., Bebianno, M. J., & Cabral, H. N. (2011). Short-term variability of multiple biomarker response in fish from estuaries: influence of environmental dynamics. *Marine environmental research*, 72(4), 172-178. <https://doi.org/10.1016/j.marenvres.2011.08.001>
- Forio, M. A. E., & Goethals, P. L. M. (2020). An integrated approach of multi-community monitoring and assessment of aquatic ecosystems to support sustainable development. *Sustainability (Switzerland)*, 12(14). <https://doi.org/10.3390/su12145603>
- Fulton, M. H., & Key, P. B. (2001). Acetylcholinesterase inhibition in estuarine fish and invertebrates as an indicator of organophosphorus insecticide exposure and effects. *Environmental Toxicology and Chemistry: An International Journal*, 20(1), 37-45. <https://doi.org/10.1002/etc.5620200104>
- Ge, W., Yan, S., Wang, J., Zhu, L., Chen, A., & Wang, J. (2015). Oxidative stress and DNA damage induced by imidacloprid in zebrafish (*Danio rerio*). *Journal of Agricultural and Food Chemistry*, 63(6), 1856–1862. <https://doi.org/10.1021/jf504895h>
- Giacomazzo, M., Bertolo, A., Brodeur, P., Massicotte, P., Goyette, J. O., & Magnan, P. (2020). Linking fisheries to land use: How anthropogenic inputs from the watershed

- shape fish habitat quality. *Science of the Total Environment*, 717. <https://doi.org/10.1016/j.scitotenv.2019.135377>
- Godoy, V., Blázquez, G., Calero, M., Quesada, L., & Martín-Lara, M. A. (2019). The potential of microplastics as carriers of metals. *Environmental Pollution*, 255, 113363. <https://doi.org/10.1016/j.envpol.2019.113363>
- Hazlina, A. Z., Devanthiran, L., & Fatimah, H. (2019). Morphological changes and DNA damage in *Chlorella vulgaris* (UMT-M1) induced by Hg²⁺. *Malaysian Applied Biology*, 48(1), 27-33. <https://www.jms.mabjournal.com/index.php/mab/article/view/2286>
- He, B., Goonetilleke, A., Ayoko, G. A., & Rintoul, L. (2020). Abundance, distribution patterns, and identification of microplastics in Brisbane River sediments, Australia. *Science of the Total Environment*, 700, 134467. <https://doi.org/10.1016/j.scitotenv.2019.134467>
- Hoang, H. G., Lin, C., Tran, H. T., Chiang, C. F., Bui, X. T., Cheruiyot, N. K., Shern, C., & Lee, C. W. (2020). Heavy metal contamination trends in surface water and sediments of a river in a highly-industrialized region. *Environmental Technology & Innovation*, 20, 101043. <https://doi.org/10.1016/j.eti.2020.101043>
- Iturburu, F. G., Bertrand, L., Mendieta, J. R., Amé, M. V., & Menone, M. L. (2018). An integrated biomarker response study explains more than the sum of the parts: oxidative stress in the fish *Australoheros facetus* exposed to imidacloprid. *Ecological Indicators*, 93, 351-357. <https://doi.org/10.1016/j.ecolind.2018.05.019>
- Izdihar, R. N. T., Perdana, D. A., Alwaini, F., & Nugroho, A. P. (2023). Individual and Combined Effects of Pesticides with Active Ingredients of Mancozeb and Methomyl on the DNA Damage of *Daphnia magna* (Straus, 1820; Cladocera, Daphniidae): 10.32526/enrj/21/20230036. *Environment and Natural Resources Journal*, 21(4), 333-344. <https://ph02.tci-thaijo.org/index.php/enrj/article/view/248418>
- Jabeen, K., Su, L., Li, J., Yang, D., Tong, C., Mu, J., & Shi, H. (2017). Microplastics and mesoplastics in fish from coastal and fresh waters of China. *Environmental Pollution*, 221, 141-149. <https://doi.org/10.1016/j.envpol.2016.11.055>
- Javed, M., Ahmad, I., Usmani, N., & Ahmad, M. (2016). Studies on biomarkers of oxidative stress and associated genotoxicity and histopathology in *Channa punctatus* from heavy metal polluted canal. *Chemosphere*, 151, 210-219. <https://doi.org/10.1016/j.chemosphere.2016.02.080>
- Ji, Y., Karbaschi, M., Abdulwahed, A., Quinete, N. S., Evans, M. D., & Cooke, M. S. (2022). A High-Throughput Comet Assay Approach for Assessing Cellular DNA Damage. *Journal of Visualized Experiments*, 2022(183), 1-22. <https://doi.org/10.3791/63559>
- Jung, M. R., Horgen, F. D., Orski, S. V., Rodriguez C., V., Beers, K. L., Balazs, G. H., Jones, T. T., Work, T. M., Brignac, K. C., Royer, S. J., Hyrenbach, K. D., Jensen, B. A., & Lynch, J. M. (2018). Validation of ATR FT-IR to identify polymers of plastic marine debris, including those ingested by marine organisms. *Marine Pollution Bulletin*, 127, 704-716. <https://doi.org/10.1016/j.marpolbul.2017.12.061>
- Karami, A., Golieskardi, A., Choo, C. K., Romano, N., Ho, Y. Bin, & Salamatinia, B. (2017). A high-performance protocol for extraction of microplastics in fish. *Science of the Total Environment*, 578, 485-494. <https://doi.org/10.1016/j.scitotenv.2016.10.213>

- Kaushal, J., Mehandia, S., Singh, G., Raina, A., & Arya, S. K. (2018). Catalase enzyme: Application in bioremediation and food industry. *Biocatalysis and agricultural biotechnology*, 16, 192-199. <https://doi.org/10.1016/j.bcab.2018.07.035>
- Kaviraj, A., Unlu, E., Gupta, A., & El Nemr, A. (2014). Biomarkers of environmental pollutants. *BioMed Research International*, 2014. <https://doi.org/10.1155/2014/806598>
- Kavitha, P., & Rao, J. V. (2008). Toxic effects of chlorpyrifos on antioxidant enzymes and target enzyme acetylcholinesterase interaction in mosquito fish, *Gambusia affinis*. *Environmental Toxicology and Pharmacology*, 26(2), 192-198. <https://doi.org/10.1016/j.etap.2008.03.010>
- Knopper, L. D., & McNamee, J. P. (2008). Use of the comet assay in environmental toxicology. *Environmental Genomics*, 171-184.
- Kontas, S., & Bostanci, D. (2020). Genotoxic Effects of Environmental Pollutant Heavy Metals on *Alburnus chalcoides* (Pisces: Cyprinidae) Inhabiting Lower Melet River (Ordu, Turkey). *Bulletin of Environmental Contamination and Toxicology*, 104(6), 763-769. <https://doi.org/10.1007/s00128-020-02857-2>
- Ladhar-Chaabouni, R., Machreki-Ajmi, M., & Hamza-Chaffai, A. (2012). Use of metallothioneins as biomarkers for environmental quality assessment in the Gulf of Gabès (Tunisia). *Environmental monitoring and assessment*, 184, 2177-2192. <https://doi.org/10.1007/s10661-011-2108-5>
- Lagadic, L. (2002). Biomarkers: useful tools for the monitoring of aquatic environments. *Revue de médecine vétérinaire*, 153(8), 581-588.
- Lakra, K. C., Banerjee, T. K., & Lal, B. (2021). Coal mine effluent-induced metal bioaccumulation, biochemical, oxidative stress, metallothionein, and histopathological alterations in vital tissues of the catfish, *Clarias batrachus*. *Environmental Science and Pollution Research*, 28(20), 25300-25315. <https://doi.org/10.1007/s11356-021-12381-3>
- Langston, W. J. (1986). Metals in sediments and benthic organisms in the Mersey estuary. *Estuarine, Coastal and Shelf Science*, 23(2), 239-261. [https://doi.org/10.1016/0272-7714\(86\)90057-0](https://doi.org/10.1016/0272-7714(86)90057-0)
- Lee, R. F., & Steinert, S. (2003). Use of the single cell gel electrophoresis/comet assay for detecting DNA damage in aquatic (marine and freshwater) animals. *Mutation Research - Reviews in Mutation Research*, 544(1), 43-64. [https://doi.org/10.1016/S1383-5742\(03\)00017-6](https://doi.org/10.1016/S1383-5742(03)00017-6)
- Lehtiniemi, M., Hartikainen, S., Näkki, P., Engström-Öst, J., Koistinen, A., & Setälä, O. (2018). Size matters more than shape: Ingestion of primary and secondary microplastics by small predators. *Food webs*, 17, e00097. <https://doi.org/10.1016/j.fooweb.2018.e00097>
- Li, B., Su, L., Zhang, H., Deng, H., Chen, Q., & Shi, H. (2020). Microplastics in fishes and their living environments surrounding a plastic production area. *Science of the Total Environment*, 727, 138662. <https://doi.org/10.1016/j.scitotenv.2020.138662>
- Li, J., Ouyang, Z., Liu, P., Zhao, X., Wu, R., Zhang, C., Lin, C., Li, Y., & Guo, X. (2021). Distribution and characteristics of microplastics in the basin of Chishui River in Renhuai, China. *Science of The Total Environment*, 773, 145591.
- Liu, X., Zhang, L., You, L., Yu, J., Cong, M., Wang, Q., Li, F., Li, L., Zhao, J., Li, C., & Wu, H. (2011). Assessment of clam *Ruditapes philippinarum* as heavy metal bioindicators using NMR-based metabolomics. *Clean - Soil, Air, Water*, 39(8), 759-766. <https://doi.org/10.1002/clen.201000410>

- Lushchak, V. I. (2011). Environmentally induced oxidative stress in aquatic animals. *Aquatic Toxicology*, 101(1), 13–30. <https://doi.org/10.1016/j.aquatox.2010.10.006>
- Livingstone, D. R. (1993). Biotechnology and pollution monitoring: use of molecular biomarkers in the aquatic environment. *Journal of Chemical Technology & Biotechnology*, 57(3), 195–211. <https://doi.org/10.1002/jctb.280570302>
- Livingstone, D. R. (2001). Contaminant-stimulated reactive oxygen species production and oxidative damage in aquatic organisms. *Marine pollution bulletin*, 42(8), 656–666. [https://doi.org/10.1016/S0025-326X\(01\)00060-1](https://doi.org/10.1016/S0025-326X(01)00060-1)
- Lott, C., Eich, A., Makarow, D., Unger, B., Van Eekert, M., Schuman, E., Reinach, M. S., Masut, M. T., & Weber, M. (2021). Half-life of biodegradable plastics in the marine environment depends on material, habitat, and climate zone. *Frontiers in Marine Science*, 8, 662074. <https://doi.org/10.3389/fmars.2021.662074>
- Lozano, Y. M., Lehnert, T., Lehmann, A., & Rillig, M. C. (2021). Microplastic shape, polymer type, and concentration affect soil properties and plant biomass. *Frontiers in plant science*, 12, 616645. <https://doi.org/10.3389/fpls.2021.616645>
- Ma'rifah, F., Saputri, M. R., Soegianto, A., Irawan, B., & Putranto, T. W. C. (2019). The change of metallothionein and oxidative response in gills of the *Oreochromis niloticus* after exposure to copper. *Animals*, 9(6), 1–11. <https://doi.org/10.3390/ani9060353>
- Marklund, S., & Marklund, G. (1974). Involvement of the Superoxide Anion Radical in the Autoxidation of Pyrogallol and a Convenient Assay for Superoxide Dismutase. *European Journal of Biochemistry*, 47(3), 469–474. <https://doi.org/10.1111/j.1432-1033.1974.tb03714.x>
- Maurya, P. K., & Malik, D. S. (2016). Distribution of heavy metals in water, sediments and fish tissue (*Heteropneustis fossilis*) in Kali River of western UP India. *International Journal of Fisheries and Aquatic Studies*, 4(2), 208–215.
- McNeish, R. E., Kim, L. H., Barrett, H. A., Mason, S. A., Kelly, J. J., & Hoellein, T. J. (2018). Microplastic in riverine fish is connected to species traits. *Scientific reports*, 8(1), 11639. <https://doi.org/10.1038/s41598-018-29980-9>
- Meng, H., Lin, Y., Zhong, W., Zhao, Z., Shen, L., Ling, Z., Zhao, K., & Xu, S. (2023). Fish Biomonitoring and Ecological Assessment in the Dianchi Lake Basin Based on Environmental DNA. *Water (Switzerland)*, 15(3). <https://doi.org/10.3390/w15030399>
- Menekes, D., & Nowack, B. (2023). Predicting microplastic masses in river networks with high spatial resolution at country level. *Nature Water*, 1(6), 523–533. <https://doi.org/10.1038/s44221-023-00090-9>
- Mishra, S., Dash, D., Al-Tawaha, A. R. M. S., & Das, A. P. (2022). A review on heavy metal ion adsorption on synthetic microfiber surface in aquatic environments. *Applied Biochemistry and Biotechnology*, 194(10), 4639–4654. <https://doi.org/10.1007/s12010-022-04029-w>
- Modesto, K. A., & Martinez, C. B. R. (2010). Roundup® causes oxidative stress in liver and inhibits acetylcholinesterase in muscle and brain of the fish *Prochilodus lineatus*. *Chemosphere*, 78(3), 294–299. <https://doi.org/10.1016/j.chemosphere.2009.10.047>
- Monteiro, P. M. S., Van Der Plas, A., Mohrholz, V., Mabilile, E., Pascall, A., & Joubert, W. (2006). Variability of natural hypoxia and methane in a coastal upwelling system: Oceanic physics or shelf biology? *Geophysical Research Letters*, 33(16), 1–5. <https://doi.org/10.1029/2006GL026234>

- Nagarani, N., Devi, V. J., & Kumaraguru, A. K. (2012). Identification of DNA damage in marine fish *Theraponjarbua* by comet assay technique. *Journal of Environmental Biology*, 33(4), 699–703.
- Nalivaikien, R., & Kalcien, E. V. (2023). *Response of Oxidative Stress and Neurotoxicity Biomarkers in Rainbow Trout (Oncorhynchus Mykiss) After Exposure to Six- Metal Mixtures*. 1–13.
- Neves, D., Sobral, P., Ferreira, J. L., & Pereira, T. (2015). Ingestion of microplastics by commercial fish off the Portuguese coast. *Marine Pollution Bulletin*, 101(1), 119–126. <https://doi.org/10.1016/j.marpolbul.2015.11.008>
- Nor, M. N. H., Kooi, M., Diepens, N. J., & Koelmans, A. A. (2021). Lifetime accumulation of microplastic in children and adults. *Environmental science & technology*, 55(8), 5084–5096. <https://doi.org/10.1021/acs.est.0c07384>
- Nuelle, M. T., Dekiff, J. H., Remy, D., & Fries, E. (2014). A new analytical approach for monitoring microplastics in marine sediments. *Environmental Pollution*, 184, 161–169. <https://doi.org/10.1016/j.envpol.2013.07.027>
- Nugroho, A. P., Handayani, N. S. N., Darmasiwi, S., Zulfikar, W. G., & Rizki, A. A. (2020). Biochemical responses and dna damage of *chlorella pyrenoidosa* h. Chick upon exposure to combined cu and cd at environmentally realistic levels. *Environment and Natural Resources Journal*, 18(3), 290–303. <https://doi.org/10.32526/enmrj.18.3.2020.28>
- Olivares-Rubio, H. F., & Espinosa-Aguirre, J. J. (2021). Acetylcholinesterase activity in fish species exposed to crude oil hydrocarbons: A review and new perspectives. *Chemosphere*, 264, 128401. <https://doi.org/10.1016/j.chemosphere.2020.128401>
- Oliveira, L. F. de, Cabral, M. T., Vieira, C. E. D., Antoniazzi, M. H., Risso, W. E., & Martinez, C. B. dos R. (2016). Metals bioaccumulation and biomarkers responses in the Neotropical freshwater clam *Anodontites trapesialis*: Implications for monitoring coal mining areas. *Science of the Total Environment*, 571, 983–991. <https://doi.org/10.1016/j.scitotenv.2016.07.086>
- Oruc, E. (2012). Oxidative stress responses and recovery patterns in the liver of *oreochromis niloticus* exposed to chlorpyrifos-Ethyl. *Bulletin of Environmental Contamination and Toxicology*, 88(5), 678–684. <https://doi.org/10.1007/s00128-012-0548-4>
- Osman, K. M., Al-Maary, K. S., Mubarak, A. S., Dawoud, T. M., Moussa, I. M., Ibrahim, M. D., Hessain, A. M., Orabi, A. & Fawzy, N. M. (2017). Characterization and susceptibility of streptococci and enterococci isolated from Nile tilapia (*Oreochromis niloticus*) showing septicemia in aquaculture and wild sites in Egypt. *BMC veterinary research*, 13, 1–10. <https://doi.org/10.1186/s12917-017-1289-8>
- Pandey, S., Parvez, S., Sayeed, I., Haque, R., Bin-Hafeez, B., & Raisuddin, S. (2003). Biomarkers of oxidative stress: A comparative study of river Yamuna fish *Wallago attu* (Bl. & Schn.). *Science of the Total Environment*, 309(1–3), 105–115. [https://doi.org/10.1016/S0048-9697\(03\)00006-8](https://doi.org/10.1016/S0048-9697(03)00006-8)
- Padmini, E., & Rani, M. U. (2009). Evaluation of oxidative stress biomarkers in hepatocytes of grey mullet inhabiting natural and polluted estuaries. *Science of the total environment*, 407(15), 4533–4541. <https://doi.org/10.1016/j.scitotenv.2009.04.005>

- Park, T. J., Lee, S. H., Lee, M. S., Lee, J. K., Lee, S. H., & Zoh, K. D. (2020). Occurrence of microplastics in the Han River and riverine fish in South Korea. *Science of the Total Environment*, 708, 134535. <https://doi.org/10.1016/j.scitotenv.2019.134535>
- Parvin, F., Jannat, S., & Tareq, S. M. (2021). Abundance, characteristics and variation of microplastics in different freshwater fish species from Bangladesh. *Science of the Total Environment*, 784. <https://doi.org/10.1016/j.scitotenv.2021.147137>
- Piskula, P., & Astel, A. M. (2023). Microplastics in Commercial Fishes and By-Catch from Selected FAO Major Fishing Areas of the Southern Baltic Sea. *Animals*, 13(3), 458. <https://doi.org/10.3390/ani13030458>
- Plessl, C., Otachi, E. O., Körner, W., Avenant-Oldewage, A., & Jirsa, F. (2017). Fish as bioindicators for trace element pollution from two contrasting lakes in the Eastern Rift Valley, Kenya: spatial and temporal aspects. *Environmental science and pollution research*, 24, 19767-19776. <https://doi.org/10.1007/s11356-017-9518-z>
- Podolska, M., & Napierska, D. (2006). Acetylcholinesterase activity in hosts (herring *Clupea harengus*) and parasites (*Anisakis simplex* larvae) from the southern Baltic. *ICES Journal of Marine Science*, 63(1), 161-168. <https://doi.org/10.1016/j.icesjms.2005.08.001>
- Pohanka, M., Hrabínová, M., Kuca, K., & Simonato, J. P. (2011). Assessment of acetylcholinesterase activity using indoxylacetate and comparison with the standard Ellman's method. *International journal of molecular sciences*, 12(4), 2631-2640. <https://doi.org/10.3390/ijms12042631>
- Puspitasari, D. E. (2009). Dampak pencemaran air terhadap kesehatan lingkungan dalam perspektif hukum lingkungan (Studi kasus sungai Code di Kelurahan Wirogunan Kecamatan Mergangsan dan Kelurahan Prawirodirjan Kecamatan Gondomanan Yogyakarta). *Mimbar Hukum-Fakultas Hukum Universitas Gadjah Mada*, 21(1), 23-34. <https://doi.org/10.22146/jmh.16254>
- Qiao, R., Deng, Y., Zhang, S., Wolosker, M. B., Zhu, Q., Ren, H., & Zhang, Y. (2019). Accumulation of different shapes of microplastics initiates intestinal injury and gut microbiota dysbiosis in the gut of zebrafish. *Chemosphere*, 236, 124334. <https://doi.org/10.1016/j.chemosphere.2019.07.065>
- Rahmayanti, R., Adjij, B. K., & Nugroho, A. P. (2022). Microplastic Pollution in the Inlet and Outlet Networks of Rawa Jombor Reservoir: Accumulation in Aquatic Fauna, Interactions with Heavy Metals, and Health Risk Assessment. *Environment and Natural Resources Journal*, 20(2), 192-208. <https://doi.org/10.32526/enrj/20/202100200>
- Rank, J., Lehtonen, K. K., Strand, J., & Laursen, M. (2007). DNA damage, acetylcholinesterase activity and lysosomal stability in native and transplanted mussels (*Mytilus edulis*) in areas close to coastal chemical dumping sites in Denmark. *Aquatic Toxicology*, 84(1), 50-61. <https://doi.org/10.1016/j.aquatox.2007.05.013>
- Rathnamma, V. V., & Nagaraju, B. (2014). Oxidative Stress Induced by Chlorantraniliprole in Various Tissues of Freshwater Fish *Ctenopharyngodon idella*. *Journal of Medical Sciences and Public Health*, 2(1), 21-27.
- Ruas, C. B. G., Carvalho, C. dos S., de Araújo, H. S. S., Espíndola, E. L. G., & Fernandes, M. N. (2008). Oxidative stress biomarkers of exposure in the blood of cichlid species from a metal-contaminated river. *Ecotoxicology and Environmental Safety*, 71(1), 86-93. <https://doi.org/10.1016/j.ecoenv.2007.08.018>

- Ruiz-Picos, R., & López-López, E. (2012). Gill and Liver Histopathology in *Goodea atripinnis* Jordan, Related to Oxidative Stress in Yuriria Lake, Mexico. *International Journal of Morphology*, 30(3), 1139–1149. <https://doi.org/10.4067/s0717-95022012000300060>
- Rukmana, I. H. R. (1997). *Ikan Nila, Budi Daya dan Prospek Agribisnis*. Yogyakarta: Kanisius.
- Ryan, P. B., Burke, T. A., Cohen Hubal, E. A., Cura, J. J., & McKone, T. E. (2007). Using biomarkers to inform cumulative risk assessment. *Environmental Health Perspectives*, 115(5), 833–840. <https://doi.org/10.1289/ehp.9334>
- Sabilillah, A. M., Palupi, F. R., Adji, B. K., & Nugroho, A. P. (2023). Health risk assessment and microplastic pollution in streams through accumulation and interaction by heavy metals. *Global Journal of Environmental Science and Management*, 9(4), 719–740. <https://doi.org/10.22035/gjesm.2023.04.05>
- Salam, M. A., Paul, S. C., Mohamad Zain, R. A. M., Bhowmik, S., Nath, M. R., Siddiqua, S. A., Aka, T. Das, Iqbal, M. A., Kadir, W. R., Ahamad, R. B., Khaleque, M. A., Rak, A. E., & Amin, M. F. M. (2020). Trace metals contamination potential and health risk assessment of commonly consumed fish of Perak River, Malaysia. *PLoS ONE*, 15(10 October), 1–18. <https://doi.org/10.1371/journal.pone.0241320>
- Schertzing, G., Ruchter, N., & Sures, B. (2018). Metal accumulation in sediments and amphipods downstream of combined sewer overflows. *Science of the Total Environment*, 616–617, 1199–1207. <https://doi.org/10.1016/j.scitotenv.2017.10.199>
- Schmitt, C. J., & Dethloff, G. M. (2000). Biomonitoring of Environmental Status and Trends (BEST) Program: selected methods for monitoring chemical contaminants and their effects in aquatic ecosystems. *US Geological Survey Information and Technology Report USGS/BRD-2000*, 5.
- Scott, G. R., & Sloman, K. A. (2004). The effects of environmental pollutants on complex fish behaviour: Integrating behavioural and physiological indicators of toxicity. In *Aquatic Toxicology* (Vol. 68, Issue 4, pp. 369–392). <https://doi.org/10.1016/j.aquatox.2004.03.016>
- Sekudewicz, I., Dąbrowska, A. M., & Syczewski, M. D. (2021). Microplastic pollution in surface water and sediments in the urban section of the Vistula River (Poland). *Science of the Total Environment*, 762. <https://doi.org/10.1016/j.scitotenv.2020.143111>
- Shahid, S., Sultana, T., Sultana, S., Hussain, B., Al-Ghanim, K. A., Al-Bashir, F., ... & Mahboob, S. (2022). Detecting aquatic pollution using histological investigations of the gills, liver, kidney, and muscles of *Oreochromis niloticus*. *Toxics*, 10(10), 564. <https://doi.org/10.3390/toxics10100564>
- Sharma, G., & Chadha, P. (2023). Evaluation of haematological, genotoxic, cytotoxic and ATR-FTIR alterations in blood cells of fish *Channa punctatus* after acute exposure of aniline. *Scientific Reports*, 13(1), 1–14. <https://doi.org/10.1038/s41598-023-48151-z>
- Sharma, K., Koundal, S., Chadha, P., & Saini, H. S. (2023). Assessment of textile industry effluent (untreated and microbially treated) induced genotoxic, haematological, biochemical, histopathological and ultrastructural alterations in fresh water fish *Channa punctata*. *Environmental Science and Pollution Research*, 30(52), 112086–112103. <https://doi.org/10.1007/s11356-023-30057-y>

- Shofiatun, S., Syaputri Handayani, K., Suryani, H., Irawan, B., & Soegianto, A. (2017). Oxidative stress responses in gills of white shrimp *Litopenaeus vannamei* Boone, 1931 following exposure to cadmium at different salinities. *Cahiers de Biologie Marine*, 58(4), 461–466. <https://doi.org/10.21411/CBM.A.C64CCDC>
- Silva, D. dos S., Gonçalves, B., Rodrigues, C. C., Dias, F. C., Trigueiro, N. S. de S., Moreira, I. S., de Melo e Silva, D., Sabóia-Morais, S. M. T., Gomes, T., & Rocha, T. L. (2021). A multibiomarker approach in the caged neotropical fish to assess the environment health in a river of central Brazilian Cerrado. *Science of the Total Environment*, 751, 141632. <https://doi.org/10.1016/j.scitotenv.2020.141632>
- Silva, S. F., & Lima, M. O. (2020). Mercury in fish marketed in the Amazon triple frontier and health risk assessment. *Chemosphere*, 248, 125989. <https://doi.org/10.1016/j.chemosphere.2020.125989>
- Simmers, J. W., Rhett, R. G., Kay, S. H., & Marquenie, J. M. (1986). Bioassay and biomonitoring assessments of contaminant mobility from dredged material. *Science of the Total Environment*, 56, 173–182. [https://doi.org/10.1016/0048-9697\(86\)90322-0](https://doi.org/10.1016/0048-9697(86)90322-0)
- Singh, N. P., McCoy, M. T., Tice, R. R., & Schneider, E. L. (1988). A simple technique for quantitation of low levels of DNA damage in individual cells. *Experimental Cell Research*, 175(1), 184–191. [https://doi.org/10.1016/0014-4827\(88\)90265-0](https://doi.org/10.1016/0014-4827(88)90265-0)
- Soud, G., Souayed, N., Yaktiti, F., & Maaroufi, K. (2013). Effect of acute cadmium exposure on metal accumulation and oxidative stress biomarkers of *Sparus aurata*. *Ecotoxicology and Environmental Safety*, 89, 1–7. <https://doi.org/10.1016/j.ecoenv.2012.12.015>
- Souza, F. A. C., Yujra, V. Q., Pisani, L. P., De Barros Viana, M., Monteiro de Castro, G., & Ribeiro, D. A. (2019). The use of single-cell comet assay on oral cells: A critical review. *Anticancer Research*, 39(8), 4011–4017. <https://doi.org/10.21873/anticancer.13556>
- Sulistyo, E. N., Rahmawati, S., Putri, R. A., Arya, N., & Eryan, Y. A. (2020). Identification of the Existence and Type of Microplastic in Code River Fish, Special Region of Yogyakarta. *Eksakta*, 1(1), 85–91. <https://doi.org/10.20885/EKSAKTA.voll.iss1.art13>
- Thiele, C. J., Hudson, M. D., Russell, A. E., Saluveer, M., & Sidaoui-Haddad, G. (2021). Microplastics in fish and fishmeal: an emerging environmental challenge?. *Scientific reports*, 11(1), 2045. <https://doi.org/10.1038/s41598-021-81499-8>
- Tibbetts, J., Krause, S., Lynch, I., & Smith, G. H. S. (2018). Abundance, distribution, and drivers of microplastic contamination in urban river environments. *Water (Switzerland)*, 10(11). <https://doi.org/10.3390/w10111597>
- Tice, R. R., Agurell, E., Anderson, D., Burlinson, B., Hartmann, A., Kobayashi, H., Miyamae, Y., Rojas, E., Ryu, J. C., & Sasaki, Y. F. (2000). Single cell gel/comet assay: Guidelines for in vitro and in vivo genetic toxicology testing. *Environmental and Molecular Mutagenesis*, 35(3), 206–221. [https://doi.org/10.1002/\(SICI\)1098-2280\(2000\)35:3<206::AID-EM8>3.0.CO;2-J](https://doi.org/10.1002/(SICI)1098-2280(2000)35:3<206::AID-EM8>3.0.CO;2-J)
- Tu, H. T., Silvestre, F., Scippo, M. L., Thome, J. P., Phuong, N. T., & Kestemont, P. (2009). Acetylcholinesterase activity as a biomarker of exposure to antibiotics and pesticides in the black tiger shrimp (*Penaeus monodon*). *Ecotoxicology and environmental safety*, 72(5), 1463–1470. <https://doi.org/10.1016/j.ecoenv.2009.04.008>

- Ural, M., Yildirim, N., Danabas, D., Kaplan, O., Yildirim, N. C., Ozcelik, M., & Kurekci, E. F. (2012). Some heavy metals accumulation in tissues in Capoeta umbla (Heckel, 1843) from Uzuncayir Dam Lake (Tunceli, Turkey). *Bulletin of Environmental Contamination and Toxicology*, 88(2), 172–176. <https://doi.org/10.1007/s00128-011-0474-x>
- Valavanidis, A., & Vlachogianni, T. (2010). Integrated biomarkers in aquatic organisms as a tool for biomonitoring environmental pollution and improved ecological risk assessment. *Sci. Adv. Environ. Toxicol. Ecotoxicol*, 10, 325-333.
- Valko, M., Rhodes, C. J., Moncol, J., Izakovic, M., & Mazur, M. (2006). Free radicals, metals and antioxidants in oxidative stress-induced cancer. *Chemico-Biological Interactions*, 160(1), 1–40. <https://doi.org/10.1016/j.cbi.2005.12.009>
- Verma, S., & Dubey, R. S. (2003). Lead toxicity induces lipid peroxidation and alters the activities of antioxidant enzymes in growing rice plants. *Plant Science*, 164(4), 645–655. [https://doi.org/10.1016/S0168-9452\(03\)00022-0](https://doi.org/10.1016/S0168-9452(03)00022-0)
- Viarengo, A., Ponzano, E., Dondero, F., & Fabbri, R. (1997). A simple spectrophotometric method for metallothionein evaluation in marine organisms: An application to Mediterranean and Antarctic molluscs. *Marine Environmental Research*, 44(1), 69–84. [https://doi.org/10.1016/S0141-1136\(96\)00103-1](https://doi.org/10.1016/S0141-1136(96)00103-1)
- Viarengo, A., Lowe, D., Bolognesi, C., Fabbri, E., & Koehler, A. (2007). The use of biomarkers in biomonitoring: a 2-tier approach assessing the level of pollutant-induced stress syndrome in sentinel organisms. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology*, 146(3), 281-300. <https://doi.org/10.1016/j.cbpc.2007.04.011>
- Vieira, C. E. D., Costa, P. G., Caldas, S. S., Tesser, M. E., Risso, W. E., Escarrone, A. L. V., Primel, E. G., Bianchini, A., & dos Reis Martinez, C. B. (2019). An integrated approach in subtropical agro-ecosystems: Active biomonitoring, environmental contaminants, bioaccumulation, and multiple biomarkers in fish. *Science of the Total Environment*, 666, 508–524. <https://doi.org/10.1016/j.scitotenv.2019.02.209>
- Vieira, C. E. D., Almeida, M. D. S., Galindo, B. A., Pereira, L., & Martinez, C. B. D. R. (2014). Integrated biomarker response index using a Neotropical fish to assess the water quality in agricultural areas. *Neotropical Ichthyology*, 12, 153-164. <https://doi.org/10.1590/S1679-62252014000100017>
- Vutukuru, S. S., Chintada, S., Radha Madhavi, K., Venkateswara Rao, J., & Anjaneyulu, Y. (2006). Acute effects of copper on superoxide dismutase, catalase and lipid peroxidation in the freshwater teleost fish, *Esomus danricus*. *Fish Physiology and Biochemistry*, 32(3), 221–229. <https://doi.org/10.1007/s10695-006-9004-x>
- Wang, W., Ndungu, A. W., Li, Z., & Wang, J. (2017). Microplastics pollution in inland freshwaters of China: A case study in urban surface waters of Wuhan, China. *Science of the Total Environment*, 575, 1369–1374. <https://doi.org/10.1016/j.scitotenv.2016.09.213>
- Wepener, V., van Vuren, J. H. J., Chatiza, F. P., Mbizi, Z., Slabbert, L., & Masola, B. (2005). Active biomonitoring in freshwater environments: Early warning signals from biomarkers in assessing biological effects of diffuse sources of pollutants. *Physics and Chemistry of the Earth*, 30(11-16 SPEC. ISS.), 751–761. <https://doi.org/10.1016/j.pce.2005.08.018>
- Weydert, C. J., & Cullen, J. J. (2010). Measurement of superoxide dismutase, catalase and glutathione peroxidase in cultured cells and tissue. *Nature protocols*, 5(1), 51-66. <https://doi.org/10.1038/nprot.2009.197>

- Widagda, B. L. A., Nurrochmad, F., & Kamulyan, B. (2021). Pengaruh Limbah Rumah Tangga Terhadap Kualitas Air Sungai Gajahwong Code Dan Winongo Di Yogyakarta. *Prosiding Seminar Nasional Teknik Lingkungan Kebumihan SATU BUMI*, 2(1), 241–252. <https://doi.org/10.31315/psb.v2i1.4465>
- Wu, F., Wang, Y., Leung, J. Y. S., Huang, W., Zeng, J., Tang, Y., Chen, J., Shi, A., Yu, X., Xu, X., Zhang, H., & Cao, L. (2020). Accumulation of microplastics in typical commercial aquatic species: A case study at a productive aquaculture site in China. *Science of the Total Environment*, 708(36), 135432. <https://doi.org/10.1016/j.scitotenv.2019.135432>
- Yi, Y., Yang, Z., & Zhang, S. (2011). Ecological risk assessment of heavy metals in sediment and human health risk assessment of heavy metals in fishes in the middle and lower reaches of the Yangtze River basin. *Environmental pollution*, 159(10), 2575–2585. <https://doi.org/10.1016/j.envpol.2011.06.011>
- Yousafzai, A. M., Chivers, D. P., Khan, A. R., & Ahmad, I. (2010). Comparison of Heavy Metals Burden in Two Freshwater Fishes. *Pakistan J. Zool*, 3(October), 537–544.
- Yusseppone, M. S., Bianchi, V. A., Castro, J. M., Noya Abad, T., Minaberry, Y. S., Sabatini, S. E., Luquet, C. M., Rios de Molina, M. C., & Rocchetta, I. (2020). In situ experiment to evaluate biochemical responses in the freshwater mussel *Diplodon chilensis* under anthropogenic eutrophication conditions. *Ecotoxicology and Environmental Safety*, 193(February), 110341. <https://doi.org/10.1016/j.ecoenv.2020.110341>
- Zhang, K., Hamidian, A. H., Tubić, A., Zhang, Y., Fang, J. K. H., Wu, C., & Lam, P. K. S. (2021). Understanding plastic degradation and microplastic formation in the environment: A review. In *Environmental Pollution* (Vol. 274). Elsevier Ltd. <https://doi.org/10.1016/j.envpol.2021.116554>
- Zhang, S., Ding, J., Razanajatovo, R. M., Jiang, H., Zou, H., & Zhu, W. (2019). Interactive effects of polystyrene microplastics and roxithromycin on bioaccumulation and biochemical status in the freshwater fish red tilapia (*Oreochromis niloticus*). *Science of the Total Environment*, 648, 1431–1439. <https://doi.org/10.1016/j.scitotenv.2018.08.266>
- Zhang, T., Li, L., Xu, F., Chen, X., Du, L., & Li, Y. (2020). Assessing the environmental risk, fractions, and remobilization of copper and zinc in the sediments of the Jialing River—an important tributary of the Yangtze River in China. *Environmental Science and Pollution Research*, 27(31), 39283–39296. <https://doi.org/10.1007/s11356-020-09963-y>
- Zhao, X., Qiang, M., Yuan, Y., Zhang, M., Wu, W., Zhang, J., Gao, Z., Gu, X., Ma, S., Liu, Z., Cai, L., & Han, J. (2023). Distribution of microplastic contamination in the major tributaries of the Yellow River on the Loess Plateau. *Science of the Total Environment*, 905(3), 167431. <https://doi.org/10.1016/j.scitotenv.2023.167431>