

- Arpia, RY., Tritawani, R., & Elvyra. 2012. Jenis-Jenis Parasit pada Ikan Baung (*Mystus nemurus*) dari Perairan Sungai Siak Rumbai. Skripsi. Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Riau, Pekanbaru.
- Arthur, JR., Margolis, L., Whitaker, DJ. & McDonald, TE. 1982. A quantitative study of economically important parasites (*Theragra chalcogramma*) from British Columbian waters and effects of postmortem handling on their abundance in the musculature. *Canadian Journal of Fisheries and Aquatic Science* 39: 710-726.
- Asdary, M., Prastowo, D., Yuliana., & Kusumaningrum, I. 2019. Pembesaran kakap putih (*Lates calcalifer*) dengan sistem resirkulasi *raceway*. *J. Per. Budidaya Air Payau dan Laut*. 14: 64-70.
- Ashari, C., Tumbol, RA., & Kolopita, MEF. 2014. The diagnosis of bacterial disease in tilapia (*Oreochromis niloticus*) cultured on fixed net cage in Lake Tondano. *J. Aqu.* 2(3): 24-30.
- Asia-Pacific Economic Cooperation, 2013. Training Modules on Food Safety Practices for Aquaculture. Michigan State University and the World Bank Group.
- Asmanelli, Yuliansyah, H., & Muchari, 1993. Penyakit ikan laut di lokasi keramba jaring apung di kepulauan Riau. [Marine fish diseases in floating net cages in Riau Archipelago]. In: Proceeding of Coastal Fisheries Aquaculture Conference. Maros, pp. 13-24
- Assal N., & Lin, M. 2021. PCR procedures to amplify GC-rich DNA sequences of *Mycobacterium bovis*. *J. Micro. Meth.* 181: 1-23.
- Austin, B., & Austin DA. 1999. Bacterial Fish Pathogens, Diseases of Farm and Wild Fish. 3rd (revised) edition. Springer-Praxis, Goldaming.
- Austin, B., & Austin, DA. 2007. Bacterial Fish Pathogens. Diseases of Farmed and Wild Fish, Fourth ed. Praxis Publishing, United Kingdom, XXVIII+, pp. 552.
- Azab, B., Kedia, S., & Shah, N. 2013. The value of the pretreatment albumin/globulin ratio in predicting the long-term survival in colorectal cancer. *Int. J. Col. Dis.* 28: 1629-1636. <https://doi.org/10.1007/s00384-013-1748-z>.
- Azad, IS., Tirunavukkarasu, AR., Kailasam, M., Subburaj, R., & Rajan, JJS. 2009. Ontogeny of lymphoid organs in the Asian sea bass (*Lates calcarifer*, Bloch). *Asian Fish. Sci.* 22(3): 901-913.
- Badan Pusat Statistik, 2020. Produksi perikanan Indonesia. <https://statistik.kkp.go.id/home.php?m=total&i=2> (Diakses pada 30 Juni 2021, pukul 19.00 WITA)
- Bakaletz, LO. 2004. Developing animal models for polymicrobial diseases. *Nat. Rev. Microbiol.* 2: 552-568
- Bakke, TA., Cable, J., & Harris, PD. 2007. The biology of gyrodactylid monogeneans: the "Russian-doll killers". *Adv. in Par.* 64: 161-376.

- Bakke, TA., Harris, PD., & Cable, J. 2002. Host specificity dynamics: observations on gyrodactylid monogeneans. *Int. J. Par.* 32: 281-308
- Bakke, TA., Harris, PD., Jansen, PA., & Hansen, LP. 1992. Host specificity and dispersal strategy in gyrodactylid monogeneans with particular reference to *Gyrodactylus salaris* (Platyhelminthes, Monogenea). *Dis. of Aqu. Org.* 13: 63-74.
- Balai Perikanan Budidaya Laut Ambon, 2016. Budidaya Ikan Hias Clown. Program Pengembangan Sumberdaya Perikanan BPBL, Ambon.
- Balai Perikanan Budidaya Laut Batam, 2014. Penyakit Infeksi Pada Budidaya Ikan Laut di Indonesia. Direktorat Jenderal Perikanan Budidaya, Kementerian Kelautan dan Perikanan.
- Balebona M. C., Zorrilla I., Morinigo MA., & Borrego JJ. 1998. Survey of bacterial pathologies affecting farmed Gilthead seabream (*Sparus aurata*) in southern Spain from 1990 to 1996. *Aqua.* 166: 19-35.
- Bandilla, M., Valtonen, ET., Suomalainen, LR., Aphalo, PJ., & Hakalahti, T. 2006. A link between ectoparasite infection and susceptibility to bacterial disease in rainbow trout. *Int. J. for Par.* 36(9): 987-991. DOI: 10.1016/j.ijpara.2006.05.001
- Basson, L., Van As, JG., & Fishelson, L. 1990. A new species of *Trichodina* (Ciliophora: Peritrichia) from the intestine of the surgeonfish *Acanthurus xanthopterus*. *Int. J. for Par.* 20(6): 785-787
- Ben, KA., Chaieb, K, Besbes, A., Zmantar, T., & Bakhrouf, A. 2006. Virulence and enterobacterial repetitive intergenic consensus PCR of *Vibrio alginolyticus* strains isolated from Tunisian cultured gilthead sea bream and sea bass outbreaks. *Vet. Microbiol.* 117(2-4): 321-7.
- Bernet, D., Schmidt-Posthaus, H., Wahli, T., & Burkhardt-Holm, P. 2004. Evaluation of two monitoring approaches to assess effects of waste water disposal on histological alterations in fish. *Hydrobio.* 524: 53-66.
- Biller-Takahashi, JD., Gimbo, RY., & Takahashi, LS. 2013. Leukocytes respiratory burst activity as indicator of innate immunity of pacu *Piaractus mesopotamicus*. *Braz. J. Biol.* 73(2): 1-5.
- Blahoua, KG., Adou, YE., Etilé, RND., & N'Douba, V. 2019. Microhabitats preference of *Cichlidogyrus berrebi*, *C. kothiasi* and *C. pouyaudi* (Monogenea: Ancyrocephalidae) on the gills of *Tylochromis jentinki* from Ebríé Lagoon, Côte d'Ivoire. *Life Sci. J.* 16: 72-78.
- Boeger, WA., Kritsky, DC., Patella, L., & Bueno-Silva, M. 2020. Phylogenetic status and historical origins of the oviparous and viviparous gyrodactylids (Monogeneoidea, Gyrodactylidea). *Zool. Scripta.* 50: 112-124.
- Bondad-Reantaso, MG., Subasinghe, RP., Arthur, JR., Ogawa, K., Chinabut, S., Adlard, R., Tan, Z., & Shariff, M. 2005. Disease and health management in Asian aquaculture. *Vet. Par.* 132: 249-272.

- Borrego, JJ., Valverde, EJ., Labella, AM., & Castro, D. 2015. Lymphocystis disease virus: Its importance in aquaculture. Rev. in Aq. 9(2): 1-15. Doi: 10.1111/raq.12131
- Botella, S., Pujalte, MJ., Macian, MC., Ferrus, MA., & Hernandez, J. 2002. Amplified fragment length polymorphism (AFLP) and biochemical typing of *Photobacterium damsela* subsp. *damsela*. J. Appl. Microbiol. 93(4): 681-688.
- Bottonee, EJ. 2010. *Bacillus cereus*, a volatile human pathogen. Clin. Micr. Rev. 23: 382-398.
- Bowden, TJ., Thompson, KD., Morgan, AL., Gratacap, RML., & Nikoskelainen, S. 2007. Seasonal variation and the immune response, a fish perspective. Fish Shellfish Immuno. 22:695-706.
- Bowers, JM., Mustafa, A., Speare, DJ., Conboy, GA., Brimacombe, M., Sims, DE., & Burka, JF. 2000. The physiological response of Atlantic salmon, *Salmo salar* L., to a single experimental challenge with sea lice, *Lepeophtheirus salmonis*. J. Fish Dis. 23(3): 165-172. DOI: <https://doi.org/10.1046/j.1365-2761.2000.00225.x>
- Bradley, JE., & Jackson, JA. 2008. Measuring immune system variation to help understand host-pathogen community dynamics. Parasitol. 135(7): 807-823. <https://doi.org/10.1017/s0031182008000322>
- Brichler, S., Gal, FL., Butt, A., Chevret, S., & Gordien, E. 2013. Commercial real-time reverse transcriptase PCR assays can underestimate or fail to quantify hepatitis D virus viremia. Clin. Gastr. Hepatol. 11(6): 734-4.
- Buchmann, K. 2020. Immune response to *Ichthyophthirius multifiliis* and role of IgT. Parasite Immunol. 48(8): e12675. <https://doi.org/10.1111/pim.12675>
- Buchmann, K., & Bresciani, J. 2001. An Introduction to Parasitic Disease of Freshwater rout, Denmark. DSR Publications, Delhi.
- Buchmann, K., & Uldal, A. 1994. Effects of the eye fluke infections on the growth of rainbow trout (*Oncorhynchus mykiss*) in a mariculture system. Bulletin of the Eur. Assoc. of Fish Path. 14: 104-07.
- Budd, J. 2015. Journal of fish diseases (reviewed). Canadian J. Comp. Med. 42(4): 267-271.
- Buffie, CG., & Pamer, EG. 2013. Microbiota-mediated colonization resistance against intestinal pathogens. Nat. Rev. Immunol. 13: 790-801. <https://doi.org/10.1038/nri3535>
- Burgos-Aceves, MA., Cohen, A., Smith, Y., & Faggio, C. 2018. MicroRNAs and their role on fish oxidative stress during xenobiotic environmental exposures. Ecot. Env. Saf. 148: 995-1000.
- Bush, AO., Lafferty, KD., Lotz, JM., & Shostak, AW. 1997. Parasitology meets ecology on its own terms: Margolis et al. revisited. J. Parasitol. 83: 575-583.

- Candan, A., Ang-Kucker, M., & Karatas, S. 1996. Pasteurellosis in cultured sea bass (*Dicentrarchus labrax*) in Turkey. Bull. Eur. Assoc. of Fish Path. 16: 150-153.
- Cano, I., Ferro, P., Alonso, M.C., Bergmann, SM., Oberdorfer, AM., Rosado, EG., Castro, D., & Borrego, JJ. 2007. Development of molecular techniques for detection of lymphocystis disease virus in different marine fish Species. J. App. Microb. 102(1): 32-40.
- Cappuccino, JG., & Sherman, N. 1987. Microbiology: A Laboratory Manual. The Benjamin/Cummings Publishing Company, Inc. California, 477 p.
- Carey, AF., & Carlson, JR. 2011. Insect olfaction from model systems to disease control. Proc. Natl. Acad. Sci. USA. 108: 12987-12995
- Cerezuela, R., Guardiola, FA., González, P., Meseguer, J., & Esteban, MÁ. 2012. Effects of dietary *Bacillus subtilis*, *Tetraselmis chuii*, and *Phaeodactylum tricornutum*, singularly or in combination, on the immune response and disease resistance of sea bream (*Sparus aurata* L.). Fish Shell Immuno. 33: 342-349.
- Chaisson, KE., & Hallem, EA. 2012. Chemosensory behaviors of parasites. Trends in Parasitol. 28(10): 427-436
- Chatterjee, S., & Haldar S. 2012. Vibrio related disease in aquaculture and development of rapid and accurate identification methods. Journal of Marine Science: Res. Dev. 2: 2155-9910, DOI: 10.4.172/2155-9910.S1-002.
- Christison, KW., Shinn, AP., & van As, JG. 2005. *Gyrodactylus thlapi* n.sp. (Monogenea) from *Pseudocrenilabrus philander philander* (Weber) (Cichlidae) in the Okavango Delta, Botswana. Sys. Parasitol. 60: 165-173.
- Chu, WH., & Lu, CP. 2008. In vivo fish models for visualizing *Aeromonas hydrophila* invasion pathway using GFP as a biomarker. Aqua. 277(3-4): 15-25.
- Ciulli, S., Pinheiro, ACDAS., Volpe, E., & Moscato, M. 2015. Development and application of a real-time pcr assay for the detection and quantitation of Lymphocystis disease virus. J. Virol. Meth. 213: 164-173
- Colquhoun, DJ., & Duodu, S. 2011. *Francisella* infections in farmed and wild aquatic organisms. Vet. Res. 42(1): 47. DOI: 10.1186/1297-9716-42-47.
- Cone, DK., Appy, R., Baggett, L., King, S., Gilmore, S., & Abbott, C. 2013. A new gyrodactylid (Monogenea) parasitizing bay pipefish (*Syngnathus leptorhynchus*) from the Pacific Coast of North America. J. Parasitol. 99: 183-188.
- Cox, FEG. 2001. Concomitant infections, parasites and immune responses. Parasitol. 122: S23-S38

- Cui, Y., Martlbauer, E., Dietrich, R., Luo, H., Ding S., & Zhu, K. 2019. Multifaceted toxin profile, an approach toward a better understanding of probiotic *Bacillus cereus*. *Crit. Rev. Tox.* 49(4): 342-356.
- Dalmo, RA., & Seljelid, R. 1995. The immunomodulatory effect of LPS, laminaran and sulphated laminaran [$\beta(1,3)$ -D-glucan] on Atlantic salmon, *Salmo salar* L., macrophages in vitro. *J. Fish Dis.* (2): 175-85.
- Dar, SA., Kaur, H., Chishti, MZ., Ahmad, MZF., Tak, IUR., & Dar, GH. 2016. First record of protozoan parasites in cyprinid fish, *Schizothorax niger* Heckel, 1838 from Dal Lake in Kashmir Himalayas with study on their pathogenesis. *Mic. Path.* 93: 100-104.
- Darmono, 2014. Penyakit virus pada hewan aquatik. [https:// www. scribd. com/document/ 246415725/Virus-Pada-Hewan-Aquatik](https://www.scribd.com/document/246415725/Virus-Pada-Hewan-Aquatik) (Diakses Pada 5 Januari 2021, Pukul 08.00 WITA).
- Dash, P., Sahoo, PK., Gupta, PK., Garg, LC., & Dixit, A. 2014. Immune responses and protective efficacy of recombinant outer membrane protein R (rOmpR)-based vaccine of *Aeromonas hydrophila* with a modified adjuvant formulation in rohu (*Labeo rohita*). *Fish Shellfish Immunol.* 39(2): 512-23.
- Declercq, AM., Haesebrouck F., Van-den-Broeck W., Bossier P., & Decostere A. 2013. Columnaris disease in fish, a review with emphasis on bacterium-host interactions. *Vet. Res.* 44: 27. <https://doi.org/10.1186/1297-9716-44-27>.
- de Moraes, J. 2015. Natural products with antischistosomal activity. *Future Med. Chem.* 7(6): 801-820.
- Deng, Q., Guo, QX., Zhai, YH., Wang, Z., & Gu, ZM. 2015. First record of *Chilodonella piscicola* (Ciliophora, Chilodonellidae) from two endangered fishes, *Schizothorax o'connori* and *Oxygymnocypris stewartii* in Tibet. *Parasitol. Res.* 114: 3097-3103.
- Dey, MM., Garcia, YT., Kumar, P., Piumsombun, S., Haque, MS., Li, L., Radam, A., Senaratne, A., Khiem, NT., & Koeshendrajana, S. 2008. Demand for fish in Asia: a cross-country analysis. *Aust. J. Agric. Resour. Econ.* 52: 321-338.
- Direktorat Jenderal Perikanan Budidaya, 2020. Panen kakap putih pertama di Demak. <https://kkp.go.id/djpb/bbpbapjepar/> (Diakses pada 10 Juni 2021, pukul 20.00 WITA)
- Docan, A., Cristae, V., Dedin, L., & Grecu, I. 2012. Studies of European catfish (*Silurus glanis*) leucocytes reaction in condition of rearing in flow-thru aquaculture. *Luc. Stiin. Zoot.* 53: 417-423.
- Dong, HT., Jitrakorn, S., Kayansamtuj, P., Pirarat, N., Rodkum, C., Rattanajpong, T., Senapin, S., & Saksmerprome. 2017. Infectious spleen and kidney necrosis disease (ISKND) outbreaks in farmed barramundi (*Lates calcarifer*) in Vietnam. *Fish Shellfish Immunol.* 68: 65-73.
- Drucker, EG., & Lauder, GV. 2003. Function of pectoral fins in rainbow trout: Behavioral repertoire and hydrodynamic forces. *J. Exp. Biol.* 206: 813-826.

- Eggestol, HO., Lunde, HS., Ronneseth, A., Fredman, D., Petersen, K., Mishra, CK., Furmanek, T., Colquhoun, DJ., Wergeland, HI., & Haugland, GT. 2018. Transcriptome-wide mapping of signaling pathways and early immune responses in lumpfish leukocytes upon in vitro bacterial exposure. *Sci. Rep.* 8: 52-61.
- El-Matbouli, M., & Hoffmann, R. 1989. Experimental transmission of two *Myxobolus* spp. developing bisporogeny via tubificid worms. *Parasitol. Res.* 15: 461-464.
- El-Naggar, MM., El-Naggar, AM., & Kearns, GC. 2004. Swimming in *Gyrodactylus rysavyi* (Monogenea: Gyrodactylidae) from the Nile catfish *Clarias gariepinus*. *Acta. Parasitol.* 49: 102-107.
- Eroldoğan, OT., Elsabagh, M., Emre, Y., Turchini, GM., Yılmaz, HA., Eraslan, D., Emre, N., & Evliyaoğlu, E. 2018. Circadian feeding schedules in gilthead sea bream (*Sparus aurata*) and European sea bass (*Dicentrarchus labrax*): A comparative approach towards improving dietary fish oil utilization and n-3 LC-PUFA metabolism. *Aqua.* 495: 806-814. <https://doi.org/10.1016/j.aquaculture.2018.06.070>
- Espinosa, C., Esteban, MA., & Cuesta, A. 2019. Dietary administration of PVC and PE microplastics produces histological damage, oxidative stress and immunoregulation in European Seabass (*Dicentrarchus labrax* L.) *Fish and Shellfish Immunol.* 95: 574-583. DOI: doi.org/10.1016/j.fsi.2019.10.072
- Eszterbauer, Sipos, D., Szakály, A., & Herczeg, D. 2019. Distinctive site preference of the fish parasite *Myxobolus Cerebralis* (Cnidaria, Myxozoa) During Host Invasion. *Acta. Vet. Hungarica.* 67(2): 212-223. DOI: [10.1556/004.2019.023](https://doi.org/10.1556/004.2019.023)
- Fajriani, B., Budiharjo, A., & Pujiyanto, S. 2018. Isolasi dan identifikasi molekuler bakteri antagonis terhadap *Vibrio parahaemolyticus* patogen pada udang *Litopenaeus vannamei* dari Produk probiotik dan sedimen mangrove di Rembang. *J. Biol.* 7(1): 52-63.
- Fardiaz, S. 1993. Analisis Mikrobiologi Pangan. PT. Raja Grafindo Persada, Jakarta, Indonesia. 199 p.
- Fauzy, A., Tarsim & A. Setyawan. 2014. Histopatologi organ kakap putih (*Lates calcarifer*) dengan infeksi *Vibrio alginolyticus* dan jintan hitam (*Nigella sativa*) sebagai imunostimulan. *J. Rek. Tek. Bud. Per.* 3(1): 321-326.
- Figueroa, C., Bustos, P., Torrealba, D., Dixon, B., Soto, C., Conejeros, P., & Gallardo, JA. 2017. Coinfection takes its toll: sea lice override the protective effects of vaccination against a bacterial pathogen in Atlantic salmon. *Sci. Rep.* 7(1): 17817 pp.
- Firdaus-Nawi, M., Yusoff, SM., Yusof, H., Abdullah, SH., & Zamri-Saad, M. 2013. Efficacy of feed-based adjuvant vaccine against *Streptococcus agalactiae* in *Oreochromis* spp. in Malaysia. *Aqua. Res.* 45(1): 87-96. DOI: [10.1111/j.1365-2109.2012.03207.x](https://doi.org/10.1111/j.1365-2109.2012.03207.x)

- Foissner, W. 2014. An update of 'basic light and scanning electron microscopic methods for taxonomic studies of ciliated protozoa'. *Int. J. Syst. Evol. Microbiol.* 64: 271-292.
- Food and Agriculture Organization (FAO), 2017. World aquaculture 2015: A brief overview, by Rohana Subasinghe. FAO Fisheries and Aquaculture Circular No. 1140. Rome, Italy.
- Food and Agriculture Organization (FAO), 2020a. Text by Rimmer, M. A., Cultured aquatic species information programme, *Lates calcarifer* (Block, 1790). In: FAO Fisheries and Aquaculture Department [online]. Rome. http://www.fao.org/fishery/culturedspecies/Lates_calcarifer/en.
- Food and Agriculture Organization (FAO), 2020b. The State of World Fisheries and Aquaculture. Meeting the Sustainable Development Goals; Licence: CC BY-NC-SA 3.0 IGO; Rome, Italy.
- Forouhar, VM., Mohamadi, YA., Hedayati, A., & Faggio, C. 2018. Histopathological lesions and toxicity in common carp (*Cyprinus carpio* L. 1758) induced by copper nanoparticles. *Mic. Res. Tech.* 81: 724-729.
- Forwood, JM., Bubner, EJ., Landos, M., D'Antignana, T., & Deveney, MR. 2016. Praziquantel treatment for yellowtail kingfish (*Seriola lalandi*): dose and duration safety study. *Fish Physiol. Biochem.* 42(1): 103-109.
- Foysal, MJ., & Lisa, AK. 2018. Isolation and characterization of *Bacillus* sp. strain BC01 from soil displaying potent antagonistic activity against plant and fish pathogenic fungi and bacteria. *J. Gen. Eng. Biotech.* 16(2): 387-392
- Foysal, MJ., Rahman, MM., & Alam, M. 2011. Antibiotic sensitivity and in vitro antimicrobial activity of plant extracts to *Pseudomonas fluorescens* isolates collected from diseased fish. *Int. J. Nat. Sci.* 1(4): 82-88.
- Fu, XZ., Shi, CB., Li, NQ., Pan, HJ., Chang, OQ., & Wu, SQ. 2011. Inverse PCR amplification of the complete major capsid protein gene of Lymphocystis disease virus isolated from *Rachycentron canadum* and the phylogenetic analysis of the virus. *Chinese J. Virol.* 23: 412-416.
- Fusianto, C., Hick, PM., Murwantoko, Herlambang, A., Whittington, RJ., & Becker, JA. 2021. Outbreak investigation attributes Infectious spleen and kidney necrosis virus as a necessary cause of a mortality epidemic in farmed grouper (*Epinephelus* spp.) in Bali, Indonesia. *Aqua. Rep.* 20: 1-10.
- Galli, P., Stefani, F., Zaccara, S., & Crosa, G. 2002. Occurrence of Monogenea in Italian freshwater fish (Poriver basin). *Parassitol.* 44: 189-197.
- García-Rosado, E., Cano, I., Martín-Antonio, B., Labella, A., Machado, M., Alonso, MC., Castro, D., & Borrego, JJ. 2007. Co-occurrence of viral and bacterial pathogens in disease outbreaks affecting newly cultured sparid fish. *Int. Microb.* 10: 193-199, DOI: 10.2436/20.1501.01.27

- Garcia-Vasquez, A., Guzman-Valdivieso, I., Razo-Mendivil, U., & Rubio-Godoy, M. 2018a. Three new species of *Gyrodactylus* von Nordmann, 1832 described from *Goodea atripinnis* (Pisces: Goodeidae), an endemic freshwater fish from the central highlands of Mexico, Parasitol. Res. 117: 139-150, <https://doi.org/10.1007/s00436-017-5680-y>.
- Garcia-Vasquez, A., Pinacho-Pinacho, CD., Martinez-Ramirez, E., & Rubio-Godoy, M. 2018b. Two new species of *Gyrodactylus* von Nordmann, 1832 from *Profundulus oaxacae* (Pisces: Profundulidae) from Oaxaca, Mexico, studied by morphology and molecular analyses, Parasitol. Int. 67: 517-527. <https://doi.org/10.1016/j.parint.2018.03.003>.
- Garcia-Vasquez, A., Razo-Mendivil, U., & Rubio-Godoy, M. 2015. Morphological and molecular description of eight new species of *Gyrodactylus* von Nordmann, 1832 (Platyhelminthes: Monogenea) from poeciliid fishes, collected in their natural distribution range in the Gulf of Mexico slope, Mexico. Parasitol. Res. 114: 3337-3355. <https://doi.org/10.1007/s00436-015-4559-z>.
- Geven, EJ., & Klaren, PH. 2017. The teleost head kidney: integrating thyroid and immune signalling. Dev. Comp. Immunol. 66: 73–83.
- Go, J., Lancaster, M., Deece, K., Dhungyel, O., Whittington, R. 2006. The molecular epidemiology of iridovirus in Murray cod (*Maccullochella peelii peelii*) and dwarf gourami (*Colisa lalia*) from distant biogeographical regions suggests a link between trade in ornamental fish and emerging iridoviral diseases. Molecul. Cell. Prob. 20: 212-222.
- Goda, AMAS., Ahmed, SR., Nazmi, HM., Aboseif, A., Taha, MKS., Fadda, SH., Baromh, MZ., El-Haroun, E., & Davies, S. 2020. Assessment of a high protein distillers dried grain (HP-DDG) augmented with phytase in diets for European seabass, *Dicentrarchus labrax* fingerlings on growth performance, hematological status, immune response and related gut and liver histology. Aqua. 529(2): 1-35. DOI: 10.1016/j.aquaculture.2020.735617
- Gomes, GB., Hutson, KS., Domingos, JA., Villamil, SI., Huerliman, R., Miller, TL., & Dean, R. 2019. Parasitic protozoan interactions with bacterial microbiome in a tropical fish farm. Aqua. 502: 196-201.
- Gomes, GB., Jerry, DR., Miller, TL., & Hutson, KS. 2016. Current status of parasitic ciliates *Chilodonella* spp. (Phyllopharyngea, Chilodonellidae) in freshwater fish aquaculture. J. Fish Dis. 405: 703-715.
- Gorman, R., Bloomfield, S., & Adley, CC. 2002. A study of cross-contamination of foodborne pathogens in the domestic kitchen in the Republic of Ireland. Int. J. Food Microb. 76: 143-150
- Grabda, J. 1991. Marine Fish Parasitology. An Outline. Polish Scientific Publisher, New York. 306 p.
- Graham, AL., Cattadori, IM., Lloyd-Smith, JO., Ferrari, MJ., & Bjornstad, ON. 2007. Transmission consequences of coinfection: Cytokines writ large? Trends in Parasitol. 23(6): 284-291. <https://doi.org/10.1016/j.pt.2007.04.005>

- Grano-Maldonado, MI. 2014a. *Gyrodactylus gasterostei* a difficult meal to swallow for the three-spined sticklebacks, *Gasterosteus aculeatus* L. Scanning 36: 614-621.
- Grano-Maldonado, MI. 2014b. Ultrastructure of the external sensory apparatus of *Gyrodactylus gasterostei* Gläser, 1974. Microsc. Res. Tech. 77: 740-747.
- Grano-Maldonado, MI., Gisbert, E., Hirt-Chabbert, J., Paladini, G., Roque, A., Bron, JE., & Shinn, AP. 2011. An infection of *Gyrodactylus anguillae* Ergens, 1960 (Monogenea) associated with the mortality of glass eels (*Anguilla anguilla* L.) on the north-western Mediterranean Sea board of Spain. Vet. Parasitol. 180: 323-331
- Grano-Maldonado, MI., Moreno-Navas, J., & Rodriguez-Santiago, MA. 2018. Transmission Strategies Used by *Gyrodactylus gasterostei* (Monogenea) on its host, the three-spined stickleback *Gasterosteus aculeatus*. Fish. 3(2): 1-11.
- Grisez, L., Reyniers, J., Verdonck, L., Swings, J., & Ollevier, F. 1997. Dominant intestinal micro-flora of seabream and seabass larvae, from two hatcheries, during larvae development. Aqua. 155: 387-99.
- Gunawan, Setiawati, KM., & Hutapea, JH. 2011. Produktivitas induk ikan capungan Banggai (*Pterapogon kauderni*) F0 dan F1 di hatchery. Pros. Forum Inov. Tek. Akua. halaman 1211-1216.
- Guttman, JA., & Finlay, BB. 2009. Tight junctions as targets of infectious agents. (BBA) – Biom. 1788: 832-841. DOI: 10.1016/j.bbamem.2008.10.028
- Hadiroseyani, Y., Hariyadi, P., & Nuryati, S. 2006. Inventarisasi parasit lele dumbo (*Clarias* sp.) di daerah Bogor. Akuakultur Indonesia. Departemen Budidaya Perikanan Fakultas Perikanan dan Ilmu Kelautan, IPB. Bogor.
- Haenen, OLM., Fouz, B., Amaro, C., Isern, MM., Mikkelsen, H., Travers, MA., Renault, T., Wardle, R., Hellstrom, A., & Dalsgaard, I., 2014. Vibriosis in aquaculture, 16th EAAP conference, Tampere, Finland. Bull. Eur. Assoc. Fish Path. 34: 138-148.
- Hahn, MW., & Höfle, MG. 2001. Grazing of protozoa and its effect on populations of aquatic bacteria. FEMS Microb. Eco. 35: 113-121.
- Hallem, EA. Dilmann, AR., Hong, AV., Zhang Y., & Yano, JM. 2011. A sensory code for host seeking in parasitic nematodes. Curr. Biol. 21: 377-383
- Hallem, EA., Rengarajan, M., Ciche, TA., & Sternberg, PW. 2007. Nematodes, bacteria, and flies: a tripartite model for nematode parasitism. Curr. Biol. 17: 898-904.
- Hamed, SB., Ranzani-Paivaa, MJT., Tachibanaa, L., Diasa, DDC., Ishikawaa, CM., & Esteban, MA. 2018. Fish pathogen bacteria: Adhesion, parameters influencing virulence and interaction with host cells. Fish and Shellfish Immunol. 80: 550-562.

- Haniffa, MA., & AbdulKader Mydeen, K.P. 2011. Hematological changes in *Channa striatus* experimentally affected by *Aeromonas hydrophila*. *Biores. Bull.* 4: 246-253.
- Hardi, EH. 2015. *Parasit Biota Akuatik*. Mulawarman University Press, Samarinda. 118 pp.
- Hardi, EH., Sukarti, K., Agriandini, M., Kusuma, IW., & Nugroho, RA. 2018. The comparative studies of Borneo plant extracts to increases vaccine efficacy in Tilapia, *oreochromis niloticus*. *J. Akua. Indo.* 17(2):158-167.
- Harms, CA. 1996. Treatments for parasitic diseases of aquarium and ornamental fish. *Sem. Avian & Exotic Pet. Med.* 2(5): 54-63.
- Harris, PD. 1993. Interactions between reproduction and population biology in gyrodactylid monogeneans-A review. *Bul. Franc. de la Peche et de la Piscicul.* 1: 47-65.
- Harris, PD., Soleng, A., & Bakke, TA. 2000. Increased suscepibility of salmonids to the monogenean *Gyrodactylus salaries* following administration of hydrocortisone acetate. *Parasitol.* 120: 57-64.
- Hartgers, FC., & Yazdanbakhsh, M. 2006. Co-infection of helminths and malaria: modulation of the immune responses to malaria. *Par. Immunol.* 28: 497-506
- Hartono, TT., & Nasution, Z. 2006. Status and constrains of carp aquaculture industry development in Indonesia. *Bul. Eko. Perikan.* 6(2): 1-14
- Haryono, S., Mulyana, & Lusiastuti, MA. 2016. Inventory of ectoparasites on goldfish (*Carassius auratus*) in District Ciseeng Bogor Regency. *J. Mina Sains.* 2(2): 71-79
- Hasnidar, 2018. Identifikasi dan prevalensi ektoparasit dan endoparasit pada ikan kerapu lumpur (*Epinephelus Tauvina*) di Kecamatan Talawi Kabupaten Batu Bara. *J. Bud. Per.* 1(1): 17-25. <http://jurnal.una.ac.id/index.php/tor/index>
- Hassan, MAH. 1999. Trichodiniasis in farmed freshwater Tilapia in Eastern Saudi Arabia. *J. Kau. Mar. Sci.* 10: 157-168.
- Hastari, IB., Sarjito. & Prayitno, SB. 2014. Karakterisasi agensia penyebab vibriosis dan gambaran histologi ikan kerapu macan (*Epinephelus Fuscoguttatus*) dari karamba jaring apung Teluk Hurun Lampung. *J. Aqua. Manag. Tech.* 3(3): 86-94.
- Hastein, T., Hjeltnes, B., Lillehaug, A., Utne Skare, J., Berntssen, M., & Lundebye, AK. 2006. Food safety hazards that occur during the production stage: challenges for fish farming and the fishing industry, *Rev. Sci. Tech. Off. Int. Epiz.* 25: 607-625.
- Hidayat, R., Harpen, E., & Wardiyanto, E. 2014. Hematology profile of *Lates calcallifer* stimulated by black cumin (*Nigella sativa*) and its effectiveness against *Vibrio alginolyticus* infection. *J. Fish.* 3(1): 327-334.

- Hidayati, N., Bakri, M., Rusli., Fahrimal, Y., Hambal, M., & Daud, R. 2016. Identifikasi parasit pada ikan tongkol (*Euthynnus Affinis*) di tempat pelelangan ikan Lhoknga Aceh Besar. J. Med. Vet., 10(1): 5-8.
- Hill, BJ. 2005. The need for effective disease control in international aquaculture. Dev. Bio. 121: 3-12.
- Holzer, AS., Sommerville, C., & Wootten, R. 2006. Molecular studies on the seasonal occurrence and development of five myxozoans in farmed *Salmo trutta* L. Parasitol. 132(2): 193-205.
- Howell, K, & de Leeuw, E. 2018. Cell adhesion properties of human defensins. Bioch. Biophys. Res. Com. 502: 238-242. DOI: 10.1016/J.BBRC.2018.05.150
- Huang, Y., Xiaogang Chen, X., Li, X., Shu, P., Wang, H., Hou, T., Wang, Y., Song, F., & Zhang, J. 2022. A proof-of-principle study on implementing polymerase chain displacement reaction (PCDR) to improve forensic low-template DNA analysis. For. Sci. Int: Gen. 56: 102609
- Hughes, GM., & Morgan, M. 1973. The structure of fish gills in relation to their respiratory function. Biol. Rev. 48: 419-475.
- Huyse, T., Malmberg, G., & Volckaert, FAM., 2004. Four new species of *Gyrodactylus* von Nordmann, 1832 (Monogenea, Gyrodactylidae) on gobiid fishes: combined DNA and morphological analyses. Syst. Parasitol. 59: 103-120.
- International Committee on Taxonomy of Viruses, 2021. Virus Taxonomy: 2021 release. <https://talk.ictvonline.org/taxonomy/> (Diakses pada 20 Juli, 2021 pukul 15.00 WITA)
- Iqbal, Z., & Imtiaz, HM. 2016. Parasites of double tail goldfish, *Carassius auratus* L. imported to Pakistan. Punjab Univ. J. Zool. 31(2): 223-228.
- Iqbal, Z., & Rehaman, BG. 2014. Parasitic Infestation of an ornamental fish comet, *Carassius auratus* L. imported to Pakistan. Biol. (Pakistan). 60(1): 103-107
- Irianto, A., & Asmanelli. 1992. Pengaruh penggunaan oxytetracycline terhadap kelangsungan hidup ikan kakap putih *Latca calcarifer* Bloch 1970. Prosiding Rapat Teknis Ilmiah Penelitian Perikanan Budidaya Pantai, Tanjung pinang. Badan Litbang Pertanian, Balitkandita-Maros.
- Irmawati., Marlina, AC., Alimuddin., & Kadriah, IAK. 2021. Budidaya Ikan Kakap Putih: Tinjauan Kelayakan di Keramba Jaring Apung dan tambak tradisional. Penerbit Nas Media Pustaka, Makassar. 119 pp.
- Irmawati, Umar, MT., Husain, AAA., Malina, AC., Kadir, NN., & Alimuddin. 2020. Distribution and character of Asian seabass (*Lates calcarifer* Bloch 1970) in South Sulawesi. IOP conf. Ser: earth and Env. Sci. 564: 1-9. DOI:10.1088/1755-1315/564/1/012011

- Isroni, W., Setyawati, D., & Maulida, N. 2019. Komunitas bakteri pada sistem resirkulasi pada budidaya lele dumbo (*Clarias gariepinus*). J. Aqua. and Fish Health. 8(3): 159-166.
- Jagruthi, C., Yogeshwari, G., Anbazahan, SM., Mari, LSS., Arockiaraj, J., Mariappan, P., Sudhakar, GRL., Balasundaram, C., & Harikrishnan, R. 2014. Effect of dietary astaxanthin against *Aeromonas hydrophila* infection in common carp, *Cyprinus carpio*. Fish & Shellfish Immunol. 41: 674-680
- Jancovich, JK., Chinchar, VG., Hyatt, A., Miyazaki, T., Williams, T. & Zhang, QY. 2012. Family Iridoviridae. In: King, A. M. Q., Adams, M. J., Carstens, E. B., & Lefkowitz, E. J. 2012. (eds.) Virus taxonomy: classification and nomenclature of viruses. Ninth Report of the International Committee on Taxonomy of Viruses. Elsevier/Academic Press, Amsterdam, pp. 193-210
- Johnny, F., & Roza, D. 2009. Iridovirus infection case on seed of coral grouper fish, *Epinephelus Corallicola* In Hatchery. J. Fish. Sci. 9(1): 8-12.
- Johnston, B., & Yeeting, B. 2006. Economics and Marketing of the Live Reef Fish Trade in Asia–Pacific. Australian Centre for International Agricultural Research, Canberra.
- Jones, SRM. 2001. The occurrence and mechanisms of innate immunity against parasites in fish. Dev. Comp. Immunol. 25(8-9): 841-852. [https://doi.org/10.1016/s0145-305x\(01\)00039-8](https://doi.org/10.1016/s0145-305x(01)00039-8)
- Jung, SJ., Kim, SR., Joung, IY., Kitamura, SI., Ceong, HT., & Oh, M.J 2008. Distribution of marine birnavirus in cultured olive flounder *Paralichthys olivaceus* in Korea. J. Microbiol. 46: 265-273
- Kallert, DM., Eszterbauer, E., Grabner, D., & El-Matbouli, M. 2009. In vivo exposure of susceptible and non-susceptible fish species to *Myxobolus cerebralis* actinospores reveals nonspecific invasion behaviour. Dis. Aquat. Org. 84: 123 -130.
- Kathirkaman, P., Ayyaru, G., Serelathan, MV., Singaravel, V., & Gunasekaran, T. 2018. Innate immunological responses of Asian seabass, *Lates calcarifer* (Bloch, 1790) for experimentally challenged *Aeromonas hydrophila* infection. Com Cli Path 5 pp. <https://doi.org/10.1007/s00580-018-2683-8>
- Kementerian Kelautan dan Perikanan, 2018. Produksi Perikanan dan Kelautan. Forum Merdeka Barat 9 Kementerian Komunikasi dan Informatika, Jakarta.
- Kementerian Kelautan dan Perikanan, 2020. Laporan Indikator Kerja triwulan 2 KKP, Jakarta. Laporan kinerja tahun 2020. [https://kkp.go.id/an-component/media/upload-gambar-pendukung/LKJ%20KKP%202020%20Revisi%20\(2\)%20\(1\).pdf](https://kkp.go.id/an-component/media/upload-gambar-pendukung/LKJ%20KKP%202020%20Revisi%20(2)%20(1).pdf)
- Kementerian Kelautan dan Perikanan, 2021. Produktivitas Perikanan Indonesia. Forum Merdeka Barat 9 Kementerian Komunikasi dan Informatika, Jakarta.
- Khan, RA. 1991. Mortality in Atlantic salmon (*Salmo salar*) associated with trichodinid ciliates. J. Wildlife Dis. 27: 153-155.

- Khan, RA. 2009. Parasites causing disease in wild and cultured fish in Newfoundland. *Icel. Agric. Sci.* 22: 29-35.
- Khan, RA., & Ghosh, K. 2013. Evaluation of phytase production by fish gut bacterium, *Bacillus subtilis*, for processing of *Ipomoea aquatica* leaves as probable aquafeed ingredient. *J. Aqu. Food Product Tech.* 22: 508-519.
- Khan, RA., Bowering, WR., Burgeois, C., Lear, H., & Pippy, JH. 1986. Myxosporean parasites of marine fish from the continental shelf off Newfoundland and Labrador. *Can. J. Zool.* 64: 2218-2226
- Kinsella, JE., & Lokesh, B. 1990. Dietary lipids, eicosanoids and the immune system. *Crit. Care Med.* 18(2): S94-S113.
- Kitamura, SI., Jung, SJ., Kim, WS., Nishizawa, T., Yoshimizu, M., & Oh, MJ. 2006. A new genotype of *Lymphocystivirus*, LCDV-RF, from lymphocystis disease rockfish. *Arch. Virol.* 151: 607-615. DOI 10.1007/s00705-005-0661-3.
- Kleinertz, S. 2010. Fish Parasites as Bioindicators: Environmental Status of Coastal Marine Ecosystems and A Grouper Mariculture Farm in Indonesia. Ph.D. Thesis. University of Bremen, Bremen.
- Kleinertz, S., Damriyasa, M., Hagen, W., Theisen, S., & Palm, HW. 2014. An environmental assessment of the parasite fauna of the reef-associated grouper *Epinephelus areolatus* from Indonesian waters. *J. Helminthol.* 88: 50-63. <http://dx.doi.org/10.1017/S0022149X12000715>.
- Kleinertz, S., & Palm, HW. 2015. Parasites of the grouper fish *Epinephelus coioides* (Serranidae) as potential environmental indicators in Indonesian coastal ecosystems. *J. Helminth.* 89: 86-99.
- Klinger, R., & Floyd, RF. 2013. Introduction to Freshwater Fish Parasites. IFAS Extension, University of Florida. 14 pp.
- Koesharyani, I., Roza, D., Mahardika, K., Jhonny, F., Zafran., & Yuasa, K. 2001. Penuntun Diagnosa Penyakit Ikan II. Penyakit Ikan Laut dan Krustasea di Indonesia. Balai Penelitian Perikanan Laut Gondol-Singaraja. 49 pp.
- Koesharyani, I., Yuasa, K., Zafran, Hatai, K., 1998. Common ectoparasites of groupers in Indonesia, pp in: Proceeding of the Fifth Asian Fisheries Forum International Conference on Fisheries and Food Security beyond the Year 2000, Chiang-Mai.
- Konczal, M., Ellison, A.R., Phillips, K.P., Radwan, J., Mohammed, R.S., Cable, J., & Chadzinska, M., 2020. RNA-Seq analysis of the guppy immune response against *Gyrodactylus bullatarudis* infection. *Par. Immunol.* 42(12): e12782.
- Kordon, AO., Kari, A., & Pinchuk, L. 2018. Innate immune responses in fish: antigen presenting cells and professional phagocytes. *Turk. J. Fish. Aquat. Sci.* 18: 1123-1139.

- Kotob, MH., Menanteau-Ledouble, S., Kumar, G., Abdelzaher, M., & El-Matbouli, M. 2016. The impact of co-infections on fish: a review. *J. Vet. Res.* 47(1): 1-12. DOI: 10.1186/s13567-016-0383-4.
- Kreier, JP. 2013. *Parasitic Protozoa*, volume 8, second eds. Academic Press Inc, California.
- Kurtovic, B., Teskeredzic, E., & Teskeredzic, Z. 2008. Histological comparison of spleen and kidney tissue from farmed and wild European sea bass (*Dicentrarchus labrax* L.). *Acta Adriat.* 49: 147-154.
- Kyeon, MS., Son, SH., Noh, YH., Kim, YE., Lee, HI., & Cha, JS. 2016. *Xanthomonas euvesicatoria* causes bacterial spot disease on pepper plant in Korea. *Plant Path. J.* 32(5): 431-40.
- Labella, A., Berbel, C., Manchado, M., Castro, D., & Borrego, JJ., 2011. *Photobacterium damsela* subsp. *damsela*, an emerging pathogen affecting new cultured marine fish species in southern Spain. *Recent Adv. in Fish Farm.* 9: 135-52.
- Landsberg, JH., Kiryu, Y., Tabuchi, M., Waltzek, TB., Enge, KM., Reintjes-Tolen, Preston, A., & Pessier, AP. 2013. Co-infection by alveolate parasites and frog virus 3-like ranavirus during an amphibian larval mortality event in Florida, USA. *Dis. Aqu. Org.* 105: 89-99
- Langeland, A., Hawdon, JM., & O'Halloran, DM. 2021. NemChR-DB: a database of parasitic nematode chemosensory G-protein coupled receptors. *Int. Journal for Parasitol.* 51(5): 333-337.
- Langkosono, 2007. Budidaya ikan kerapu (Serranidae) dan kualitas perairan. *Neptunus (Maj. Ilmu Kel.)*. 014: 61-67.
- Lau, PPF., & Parry-Jones, R. 2000. *The Hong Kong Trade in Live Reef Fish for Food*. TRAFFIC East Asia and World Wide Fund for Nature Hong Kong, Hong Kong.
- Lhorente, JP., Gallardo, JA., Villanueva, B., Carabaño, MJ., & Neira, R. 2014. Disease resistance in Atlantic salmon (*Salmo salar*): coinfection of the intracellular bacterial pathogen *Piscirickettsia salmonis* and the sea louse *Caligus rogercresseyi*. *PLoS One* 9 (4): e95397. DOI: 10.1371/journal.pone.0095397
- Li, J., Ni, XD., Liu, YJ., & Lu, CP. 2011. Detection of three virulence genes *alt*, *ahp* and *aerA* in *Aeromonas hydrophila* and their relationship with actual virulence to zebrafish. *J. App. Microb.* 110: 823-830.
- Lilley, GR., & Lilley, R. 2007. Towards a sustainable marine aquarium trade: An Indonesian perspective. *SPC Live Reef Fish Inf. Bull.* #17 – November 2007.
- Lim, HH., Srisiri, K., Rerkamnuaychoke, B., & Bandhaya, A. 2019. A comparative study of whole genome amplification and low-template DNA profiling. *Forensic Science International: Gen. Supp. Ser.* 7(1): 509-511

- Lom, J. 1995. Trichodinidae and other ciliates (Phylum Ciliophora). In: Woo PTK, editor. Fish Diseases and Disorders. Wallingford: CAB International; p. 229-262
- Lom, J., & Dykova, I. 1992. Protozoan parasites of fishes. Dev. Aqua. Fish. Sci. 26: 271-279
- Lu, C., Kania, PW., & Buchmann, K. 2018. Particle effects on fish gills: An immunogenetic approach for rainbow trout and zebrafish. Aqua. 484: 98-104
- Ludyasari, A., 2016. Pengaruh Suhu *Annealing* pada Program PCR Terhadap Keberhasilan Amplifikasi DNA Udang Jari (*Metapenaeus elegans* De Man, 1907) Laguna Segara Anakan Cilacap, Jawa Tengah. Tesis. UIN Maulana Malik Ibrahim, Malang.
- Lückstädt, C. 2008. The use of acidifiers in fish nutrition. CAB Rev. 3: 1-8.
- Maarif, S. 2010. Kebijakan strategis kementerian kelautan dan perikanan dalam mendukung pembangunan nasional. Makalah Seminar Nasional Kelautan, Kobangdikal Surabaya. 15 pp.
- Machado, MH., Pavanelli, GC., & Takemoto, RM. 1994. Influence of hosts sex and size on endoparasitic infrapopulations of *Pseudoplatystoma corruscans* and *Schizodon borelli* (Osteichthyes) of the high parana river, Brazil. Rev. Bras. Parasitol. Vet. 3: 143-148.
- Madsen, HCK., Buchmann, K., & Møllergaard, S. 2000. *Trichodina* sp. (Ciliophora: Peritrichida) in eel *Anguilla anguilla* in recirculation systems in Denmark: host-parasite relations. Dis. Aqu. Org. 42: 149-152.
- Magnadottir, B. 2010. Immunological control of fish diseases. Mar. Biotec. 12: 361-379.
- Maharajan, A., Rufus, KM., Paruruckumani, PS., & Ganapirya, V. 2016. Histopathology biomarker responses in Asian seabass, *Lates calcarifer* (Bloch) exposed to copper. J. Bas. App. Zool. 77: 21-30.
- Mahardika, K., Mastuti, I., & Zafran. 2018. Intensitas parasit insang (Trematoda Monogenea: *Pseudorhabdosynochus* sp.) pada ikan kerapu hibrida melalui infeksi buatan. J. Ris. Aku. 13(2): 169-177.
- Mangunwardoyo, W., Ismayasari, R., & Riany, E. 2010. Uji patogenesis dan virulensi *Aeromonas hydrophila* stanier pada ikan nila (*Oreochromis niloticus* Lin.) melalui postulat Koch. J. Ris. Akua. 5(2): 245-255.
- Martins, ML., Cardoso, L., Marchiori, N., & de Pádua, SB. 2015. Protozoan infections in farmed fish from Brazil: diagnosis and pathogenesis. B. J. Vet. Parasitol. 24: 1-20.
- Martins, M. L., Marchiori, N., Nunes, G., & Rodrigues, M. P. 2010. First record of *Trichodina heterodontata* (Ciliophora: Trichodinidae) from channel catfish, *Ictalurus punctatus* cultivated in Brazil. Braz. J. Biol. 70(3): 637-644

- Mariyono & Sundana, A. 2002. Teknik pencegahan dan pengobatan penyakit bercak merah pada ikan air tawar yang disebabkan oleh bakteri *Aeromonas hydrophyla*. Bull. Tek. Pert. 7(1): 12-14.
- Maulana, DM., Zainal, AM., & Sugito, S. 2017. Intensitas dan prevalensi parasit pada ikan betok (*Anabas testudineus*) dari perairan umum daratan Aceh Bagian Utara. J. Ilm. Mah. Kel. & Perikan. Unsyiah. 2(1): 1-11.
- Matthews, RA. 1994. *Ichrhyophthirius mulrilliis* Fouquet 1876: infection and protective responses within the fish host. pp: Pike, A.W., Lewis, J.W. (eds.) Parasitic diseases of fish. Samam Publishing, Dyfed, United Kingdom. 17-42 pp.
- Mekuto, L., Ntwampe, SKO., & Mudumbi, JBN. 2018. Microbial communities associated with the co-metabolism of free cyanide and thiocyanate under alkaline conditions. 3 Biotech. 8(2): 93. <https://doi.org/10.1007/s13205-018-1124-3>.
- Mendoza-Palmero, CA., Blasco-Costa, I., & de Leon, GPP. 2019. Morphological and molecular characterisation of a new species of *Gyrodactylus* von Nordmann, 1832 (Monogeneoidea: Gyrodactylidae) of cichlid fishes (Perciformes) from Mexico. Parasitol. Int. 70: 102-111
- Meseguer, J., Lopez-Ruiz, A., & Esteban, MA. 1994. Melano-macrophages of the seawater teleosts, sea bass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*): Morphology, formation and possible function. Cell & Tissue Res. 277: 1-10.
- Mikkelsen, H., McMullan, R., Filloux, A. 2011. The *Pseudomonas aeruginosa* reference strain PA14 displays increased virulence due to a mutation in *ladS*. PLoS One. 6(12): e29113.
- Mizuno, S., Urawa, S., Miyamoto, M., & Hatakeyama, M. 2016. The epidemiology of the Trichodinid Ciliate *Trichodina truttae* on hatchery-reared and wild salmonid fish in Hokkaido. Fish Path. 51(4): 199-209.
- Moustafa, EM., Dawood, MAO., Assar, DH., Omara, AA., Elbially, ZI., Farrag, FA., Shukry, M., & Zayed, MM. 2020. Modulatory effects of fenugreek seeds powder on the histopathology, oxidative status, and immune related gene expression in Nile tilapia (*Oreochromis niloticus*) infected with *Aeromonas hydrophila*. Aqua. 515: 1-12. DOI: 10.1016/j.aquaculture. 2019.734589
- Muhtadin, D. 2017. Identifikasi Cacing Parasitik pada Ikan Kakap Putih (*Lates calcalifer*) di Pelabuhan Perikanan Pantai Labuan dan Pelabuhan Perikanan Nusantara Karangantu. Skripsi. Jurusan Perikanan, Fakultas Pertanian, Universitas Sultan Ageng Tirtayasa, Serang.
- Murwantoko, Handayani, CR., & Pratiwi, R. 2009. Cloning and sequence analysis of capsid protein gene of Iridovirus Indonesian isolates. Ind. J. Biotech. 14(1): 1117-1123.

- Musyaffak, M., Abida, IW., & Muhsoni, FF. 2010. Analisa Tingkat Prevalensi Dan Derajat Infeksi Parasit Pada Ikan Kerapu Macan (*Ephinephilus fuscoguttatus*) di Lokasi Budidaya Berbeda. Jurnal Kelautan 3(1): 9 pp
- Natsir, NA., & Latifa, S. 2018. Analisis kandungan protein total ikan kakap merah dan ikan kerapu bebek. J. Biol. Sci. & Edu. 7(1): 1-7.
- Neori, A., Shpige, IM., & Scharfstein, B. 2001. Land-based low-pollution integrated mariculture of fish, seaweed and herbivores: principles of development, design, operation and economics. Eur. Aqua. Soc. Spec. Pub. 29: 190-191.
- Netea, G., Van der Meer, JWM., Sutmuller, RP., Adema, GJ., & Kullberg, BJ. 2005. From the Th1/Th2 paradigm towards a Toll-like receptor/T-helper bias. Anti. Agents Chem. 49(10): 3991-3996.
- Nicholson, WL., Munakata, N., Horneck, G., & Melosh, HJSP. 2000. Resistance of *Bacillus endospores* to extreme terrestrial and extraterrestrial environments. Microb. & Mol. Biol. Rev. 64(3): 548-72.
- Ningsih, AA., Setyawan, A., & Hudaidah, S. 2016. Identifikasi parasit pada ikan kerapu (*Epinephelus* sp.) pasca terjadinya harmful algal blooms (habs) di Pantai Ringgung Kabupaten Pesawaran. J. Rek. & Tek. Bud. Per. 4(2): 479-484
- Nithya, QM., Porteen, K., & Pramanik, AK. 2007. Studies on occurrence of *Vibrio parahaemolyticus* in fin fishes and shellfishes from different ecosystem of West Bengal. Live. Res. Rural Dev. 19(1): 1-12.
- Noga, EJ. 2010. Fish Disease. Diagnosis and Treatment, (second edition). Wiley Blackwell. John Wiley & Sons. Singapore, 519 P.
- Office International des Epizooties (OIE), 2012. Manual diagnostic test for aquatic animals. Chapter 2.3.7 red sea bream iridoviral disease. hal. 345-356.
- Ogut, H., & Cavus, N. 2014. A comparison of ectoparasite prevalence and occurrence of viral haemorrhagic septicemia virus (VHSV) in whiting *Merlangius merlangus euxinus*. Rev. Biol. Mar. Oceanogr. 49: 91-96
- Oh, MJ., Kim, WS., Kitamura, SI., Lee, HK., Son, BW., Jung, TS., & Jung, SJ. 2006. Change of pathogenicity in Olive flounder *Paralichthys olivaceus* by co-infection of *Vibrio harveyi*, *Edwardsiella tarda* and marine birnavirus. Aqua. 257: 156-160
- Olstad, K., Cable, J., Robertsen, G., & Bakke, TA. 2006. Unpredicted transmission strategy of *Gyrodactylus salaris* (Monogenea: Gyrodactylidae): Survival and infectivity of parasites on dead hosts. Parasitol. 133: 33-41.
- Osorio, CR., & Lemos, ML., 2011. *Photobacterium*, pp in: Liu D, editor. Molecular detection of human bacterial pathogens. Boca Raton, FL: CRC Press Inc; p. 959-968.
- Ozturk, MO. 2005. An Investigation on metazoan parasites of common carp (*Cyprinus carpio*) in Lake Eber. Turkiye Paraz. Der. 29 (3): 204-210.

- Paladini, G., Hansen, H., Fioravanti, M. L., & Shinn, A. P. 2011. *Gyrodactylus longipes* n.sp. (Monogenea: Gyrodactylidae) from farmed gilthead seabream (*Sparus aurata* L.) from the Mediterranean. *Parasitol. Int.* 60: 410-418.
- Palic, D., Andreasen, CB., Menzel, BW., & Roth, JA. 2005. A rapid, direct assay to measure degranulation of primary granules in neutrophils from kidney of fathead minnow (*Pimephales promelas* Rafinesque, 1820). *Fish & Shellfish Immunol.* 19(3): 217-227.
- Paling, JE. 1968. A method of estimating the relative volumes of water flowing over the different gills of freshwater fish. *J. Exp. Biol.* 48: 785-802.
- Palm, HW., Kleinertz, S., & Rückert, S. 2011. Parasite diversity as an indicator of environmental change? -an example from tropical grouper (*Epinephelus fuscoguttatus*) mariculture in Indonesia. *Parasitol.* 138: 1-11. <http://dx.doi.org/10.1017/S0031182011000011>.
- Palm, HW., Yulianto, I., Theisen, S., Rückert, S., & Kleinertz, S. 2015. *Epinephelus fuscoguttatus* mariculture in Indonesia: Implications from fish parasite infections. *Reg. Stud. Mar. Sci.* 2: 54-70.
- Palmer, L.J., Hogan, N.S., & Van, MRDH. 2012. Phylogenetic analysis and molecular methods for the detection of lymphocystis disease virus from yellow perch, *Perca flavescens* (Mitchell). *J. Fish Dis.* 35: 661-667
- Paperna, I. 1975. Parasites and diseases of the grey mullet (Mugilidae) with special reference to the seas of the Near East. *Aqua.* 5: 65-80. [https://doi.org/10.1016/0044-8486\(75\)90018-6](https://doi.org/10.1016/0044-8486(75)90018-6).
- Paperna, I., & Laurencin, Fb. 1979. Parasitic infections of sea bass, *Dicentrarchus Labrax*, and gilt head sea bream, *Sparus aurata*, In *Mariculture Facilities in France*. *Aqua.* 16(2): 173-175.
- Peters, L., Burkert, S., & Grüner, B. 2021. Parasites of the liver – epidemiology, diagnosis and clinical management in the European context. *J. Hepatol.* 75: 202-218.
- Petersen, EH., Phuong, H., Dat, NK., Tuan, VA., & Truc, LV. 2016. Bioeconomics of Asian seabass, *Lates calcarifer*, culture in Vietnam. *Aqua. Eco. Manag.* 18(1): 28-44
- Pet-Soede, L., Horuodono, H., S& udarsono, 2004. SARS and the live food fish trade in Indonesia: some anecdotes. *SPC Live Reef Fish Inf. Bull.* 12: 3-9.
- Peyghan, R., Khadjeh, RH., & Enayati, A. 2014. Effect of water salinity on total protein and electrophoretic pattern of serum proteins of grass carp, *Ctenopharyngodon idella*. *Vet. Res. Forum.* 5(3): 225-229.
- Pridgeon, JW., & Klesius, PH. 2012. Major bacterial diseases in aquaculture and their vaccine development. *CAB Rev.* 7(48): 1-16.

- Putri, SM., Haditomo, AHC., & Desrina, 2016. The infestation of monogenean on consumption freshwater fish in pond culture of Ngrajek village, Magelang. *J. Aqua. Manag. Tech.* 5(1): 162-170.
- Rahayu, FD., Ekastuti, DR., & Tiuria, R. 2013. Infestasi cacing parsitik pada insang ikan mujair (*Oreochromis mossambicus*). *Acta. Vet. Indonesia* 1(1): 8-14
- Rayas, RD., Sutresna, IW., Diniarti, N., & Supii, AI. 2013. pengaruh perubahan salinitas terhadap pertumbuhan dan sintasan ikan kakap putih (*Lates calcarifer* Bloch). *J. Kel.* 6(1): 47-56.
- Reed, P., Floyd, R. F., Klinger, R. E., & Petty, D. 2012. Monogenean Parasites of Fish. IFAS Extension, University of Florida, Gainesville.
- Rejeki, S., Triyatno., & Murwantoko, 2016. Isolation and identification of *Aeromonas* spp. from diseased African catfish (*Clarias* sp.) in Ngawi Regency. *J. Fish. Gadjah Mada University.* 18(2): 55-60.
- Ressa, P. 2007. Pola Distribusi *Anisakis* sp. pada Usus Halus Ikan Kakap Putih (*Lates calcarifer*) yang Tertangkap di TPI Brondong, Lamongan. Skripsi. Program Studi Biologi, Institut Teknologi Sepuluh Nopember, Surabaya.
- Reverter, M., Bontemps, N., Lecchini, D., Banaigs, B., & Sasal, P. 2014. Use of plant extracts in fish aquaculture as an alternative to chemotherapy: current status and future perspectives. *Aqua.* 433: 50–61.
- Ridhwan., Bakri, M., & Winaruddin. 2018. Identifikasi parasit pada ikan kerapu sunu (*Plecetropomus Leopardus*) yang dijual di TPI Lhoknga Kabupaten Aceh Besar. *Jimvet.* 2(4): 614-618
- Roberts, RJ. 2012. *Fish Pathology.* Wiley & Sons (590, pp). Tasmania, Australia.
- Robertsen, B, Engstad, RE., & Jorgensen, JB. 1994. Modulation of fish immune responses. Fair Haven, NJ: Vol. I: SS Publications, USA.
- Rohde, K. 1994. Niche restriction in parasites: proximate and ultimate causes. *Parasitol.* 109: S69-S84.
- Rokhmani, 2009. Keragaman dan Tingkat serangan ektoparasit pada gurame (*Osphronemus gourami Lacepede*) tahap pendederan I dengan ketinggian lokasi pemeliharaan yang berbeda. *J. Biotika.* 7(2): 87-93.
- Rokhmani, Riwidharso, E., Ariyani, E., Darsono & Daniel, DW. 2017. Hubungan kekerabatan protozoa *Trichodina* sp yang menginfeksi benih gurame dari sentra pembenihan di Bantul Jogjakarta Prosiding Sem. Nas Masy. Biodiv. Ind. 3(2): 220-223.
- Rückert, S. 2006. Marine Fish Parasites in Indonesia: State of Infestation and Importance for Grouper Mariculture. Ph.D. Thesis. Heinrich-Heine University of Düsseldorf, Düsseldorf.

- Rückert, S., Klimpel, S., & Palm, HW. 2010. Parasites of cultured and wild brown-marbled grouper *Epinephelus fuscoguttatus* (Forsskål, 1775) in Lampung Bay, Indonesia. *Aqua. Res.* 41: 1158-1169.
- Rückert, S., Palm, HW., & Klimpel, S. 2008. Parasites fauna of sea bass under mariculture condition in Lampung Bay, Indonesia. *J. App. Ichth.* 24(3): 321-327.
- Rud, I., Kolarevic, J., Holan, AB., Berget, I., Calabrese, S., & Terjesen, BF. 2016. Deep-sequencing of the bacterial microbiota in commercial-scale recirculating and semi-closed aquaculture systems for Atlantic salmon post-smolt production. *Aquacult. Eng.* 78(A): 50-62.
- Rukyani, A., Silvia, E., Sunartot, A., & Tauhid. 1997. Peningkatan respon kekebalan non-spesifik pada ikan lele dumbo (*clarias* sp.) dengan pemberian imunostimulan (B-Glucan). *J. Pen. Per. Ind.* 3(1): 1- 10.
- Rustikawati, I., Rostika, R., Iriana, D., & Herlina, E. 2004. Intensitas dan prevalensi ektoparasit pada benih ikan mas (*Cyprinus carpio* L.) yang berasal dari kolam tradisional dan longyam di Desa Sukamulya Kecamatan Singaparna Kabupaten Tasikmalaya. *J. Aku. Ind.* 3(1): 33-39.
- Sadovy, Y., Craig, MT., Bertocini, AA., Carpenter, KE., Cheung, WWL., Choat, JH., Cornish, AS., Fennessy, ST., Ferreira, BP., Heemstra, PC., Liu, M., Myers, RF., Pollard, DA., Rhodes, KL., Rocha, LA., Russell, BC., Samoilys, MA., & Sanciangco, J. 2012. Fishing groupers towards extinction: a global assessment of threats and extinction risks in a billion dollar fishery. *F. & Fish.* 14: 119-136.
- Sahoo, PK., Kumari, J., & Mishra, BK. 2005. Non-specific immune responses in juveniles of Indian major carps. *J. App. Ichth.* 21(2): 151-155.
- Santiago FG., Krug M. J., Nielsen ME., Santos Y., & Call DR., 2004. Simultaneous detection of marine fish pathogens by using multiplex PCR and a DNA Microarray. *J. Clin. Microb.* 42: 1414-1419, DOI: 10.1128/jcm.42.4.1414-1419.2004.
- Santoro, M., Di Nocera, F., Iaccarino, D., Lawton, SP., Cerrone, A., Degli Uberti, B., Amore, MD., Affuso, A., Hochscheid, S., Maffucci, F., & Galiero, G. 2017. Pathology and molecular analysis of *Hapalotrema mistroides* (Digenea: spirorchiidae) infecting a Mediterranean loggerhead turtle *Caretta caretta*. *Dis. Aquat. Org.* 124(2): 101-108.
- Saputra, I., & Gunawan, EH. 2020. Infestasi ektoparasit pada cyprinidae (*Cyprinus carpio*) dalam rantai perdagangan. *Quarant.* 2(1): 45-57.
- Saputra, I., & Indaryanto, FR. 2018. Identifikasi bakteri *Aeromonas hydrophila* pada komoditas ikan yang dilalulintaskan menuju Pulau Sumatera melalui Pelabuhan Penyeberangan Merak – Banten. *J. Per. & Kel.* 8(5): 155-162
- Saraiva, A., Costa, J., Serrão, J., Cruz, C., & Eiras, JC. 2015. A histology-based fish health assessment of farmed seabass (*Dicentrarchus labrax* L.). *Aqua.* 448: 375-381.

- Saranya, SR., & Sudhakaran, R, 2020. Report on prevalence of tilapia lake virus infection in tilapia fishes (*Oreochromis niloticus*). Biocatalysis and Agricultural Biotechnology 27(1): 1-18 pp. DOI:10.1016/j.bcab.2020.101665
- Sari, DN. 2011. Pencegahan Infeksi Bakteri *Aeromonas hydrophila* pada Ikan Nila (*Oreochromis niloticus*) dengan Pemberian Ekstrak Etil Asetat Rimpang Temu Ireng (*Curcuma aeruginosa*). Skripsi. Universitas Indonesia. Jakarta.
- Scapigliati, G., Romano, N., Buonocore, F., Picchietti, S., Baldassini, MR., Prugnoli, D., Galice, A., Meloni, S., Secombes, C.J., Mazzini, M., & Abelli, I. 2002. The immune system of seabass, *Dicentrarchus labrax* reared in aquaculture. Dev. Compar. Immunol. 26: 151-160.
- Schelke, B. 2012. Gyrodactylid Biology, Transmission and Control. Dissertation. Organisms and Environment Research Group. School of Biological Sciences, Cardiff University.
- Scholz, T. 1999. Parasites in cultured and feral fish. Vet. Parasitol. 84: 317-335.
- Scott, SJ., & Bollinger, TK. 2014. *Flavobacterium columnare*: an important contributing factor to fish die-off in southern lakes of Saskatchewan, Canada. J. Vet. Diag. Inv. 26: 832-836.
- Senapin, S., Dong, HT., Meemetta, W., Gangnonngiw, W., Sangsuriya, P., Vanichviriyakit, R., Sonthi, M., & Nuangsaeng, B. 2019. Mortality from scale drop disease in farmed *Lates calcarifer* in Southeast Asia. J. Fish Dis. 42: 119-127.
- Shahsavani, D., Kaxerani, H., Kaveh, S. & Kanani, H. 2010. Determination of some normal serum parameters in starry Sturgeon (*Acipenser stellatus*) during spring season. Comp. Clin. Pathol. 19: 57-61.
- Sheikh, ZA., & Ahmed, I. 2016. Seasonal changes in hematological parameters of snow trout *Schizothorax plagiostomus* (Heckel 1838). Int. J. Fauna and Biol. Stud. 3(6): 33-38.
- Shen, Y., Zhang, J., Xu, X., Fu, J., Li, J. 2013. A new haplotype variability in complement C6 is marginally associated with resistance to *Aeromonas hydrophila* in grass carp. Fish Shellfish Immunol. 34(5): 1360-1365.
- Silvaraj, S. Salwany, ID. Yasin, M. Marlina, AM. Karim, & Saad, MZ. 2021. Transcriptome analysis of immune response in recombinant cell vaccine expressing OmpK vaccinated juvenile seabass (*Lates calcarifer*) head kidney against *vibrio harveyi* infection. Aqua. Rep. 21: 1-25.
- Siva, MU., Thangapandi, M., Badhul., HMA., & Kumar, TTA. 2014. Histopathological study of lymphocystis disease virus (LCDV) in cultured false clownfish, *Amphiprion ocellaris* (Cuvier, 1830) and true clownfish, *Amphiprion percula* (Lacepede, 1802). J. Coast. Life Med. 2(4): 264-269. DOI: 10.12980/JCLM.2.2014APJTD-2014-0016

- Skinner, LA. 2009. The Physiological and Immunological Effects of Vaccination on Fish Health, Welfare, and Performance. Dissertation. The University of British Columbia, New York. 139 pp.
- Snoussi, M., Hajlaoui, H., Noumi, E., Zanetti, S., & Bakhrouf, A. 2008. Phenotypic and molecular characterization of *Vibrio alginolyticus* strains recovered from juveniles and older *Sparus aurata* reared in a Tunisian marine farm. *Ann. Microbiol.* 58: 141-146.
- Sonia, ASG., & Lipton, AP. 2012. Pathogenicity and antibiotic susceptibility of *Vibrio* species isolated from the captive-reared tropical marine ornamental blue damselfish, *Pomacentrus caeruleus* (Quoy and Gaimard, 1825). *Indian J. Geo-Marine Sci.* 41(4): 348-354.
- Sorvillo, F., Lawrence, RA., Berlin, OGW., Yatabe, JA., Degiorgio, C., & Morse, SA. 2002. *Baylisascaris procyonis*: An emerging helminthic zoonosis: emerg. *Infect Dis. US Nat. Lib. Med. Nat. Inst. Health.* 8(4): 355-359.
- Soto, E., Abrams, SB., & Revan, F. 2012. Effects of temperature and salt concentration on *Francisella noatunensis* subsp. *orientalis* infections in Nile tilapia *Oreochromis niloticus*. *Di. Aqua. Org.* 101: 217-23.
- Steinel, NC, & Bolnick, DI. 2017. Melanomacrophage centers as a histological indicator of immune function in fish and other poikilotherms. *Front. in Immunol.* 8: 827-827.
- Stentiford, GD., Sritunyalucksana, K., Flegel, TW., Williams, BAP., Withyachumnarnkul, B., Itsathitpaisarn, O., & Bass, D. 2017. New paradigms to help solve the global aquaculture disease crisis. *PLOS Pathog.* 13: e1006160.
- Stewart, PS., & Costerton, JW. 2001. Antibiotic resistance of bacteria in biofilms. *Lancet.* 358: 135-138. [http://dx.doi.org/10.1016/S0140-6736\(01\)05321-1](http://dx.doi.org/10.1016/S0140-6736(01)05321-1).
- Stosik, M., Deptula, W. & Travnicek, M. 2001. Resistance in carp *Cyprinus carpio* affected by natural bacterial infection. *Vet. Med. (Czech).* 46(1): 6-11.
- Stubbs, JA. 1985. Ecological Aspects of Hepatic Microsporidiosis in Coastal Waters with Particular Reference to The Host *Taurulus bubalis*. Dissertation. University of Plymouth, Pearl.
- Su, X. 1993. Taxonomic and Biological Studies of Protozoan Parasites in Tasmanian Marine Fishes. Dissertation, University of Tasmania, Hobart.
- Subasinghe, RP., Bondad-Reantaso, MG., & McGladdery, SE. 2001. Aquaculture development, health and wealth. Tech. proceeding of the conf. on aqua. Bangkok.
- Sufardin, Sriwulan, & Anshary, H. 2021. Bacteria associated with *Trichodina* sp. infection of barramundi, *Lates calcarifer* in a fish farm in South Sulawesi, Indonesia. *AAFL Bioflux.* 14(1): 643-654.

- Sulfitri, Bahri, S., Khairuddin, Sumarni, NK., & Rahim, EA. 2020. Comparison of cork fish (*Channa striata*) Albumin content from boiling and steaming process by using biuret test. *Kovalen: J. Ris. Kim.* 6(1): 67-73.
- Sun, HY., Noe, J., Barber, J., Coyne, RS., Cassidy-Hanley, D., Clark, TG., Findly, RC., & Dickerson, HW. 2009. Endosymbiotic bacteria in the parasitic ciliate *Ichthyophthirius multifiliis*. *App. Env. Microb.* 75: 7445-7452.
- Surat Keputusan Badan Karantina Ikan pengendalian mutu dan keamanan hasil perikanan (SK-BKIPM), 2015. Petunjuk teknis pemantauan hama dan penyakit ikan karantina. Badan Karantina Ikan Pengendalian Mutu dan Keamanan Hasil Perikanan. Jakarta.
- Susilowati, F. 2020. Pembenihan dan Pembesaran Ikan Kakap Putih *Lates calcarifer* di Balai Perikanan Budidaya Laut (BPBL) Batam, Kepulauan Riau. Laporan Akhir Ahli Madya Program Studi Teknologi Produksi dan Manajemen Perikanan Budidaya. Sekolah Vokasi IPB, Bogor.
- Tang, F., & Zhao, Y. 2007. Taxonomic studies of three species of *Trichodina* Ehrenberg, 1838 with pathologic research into gill tissue of *Carassius auratus* caused by *Trichodina heterodentata* Duncan, 1977: a study of trichodinids from freshwater fishes in Chongqing II. *J. Chongqing Normal Univ.* 24: 8-14
- Tang, F., Zhang, Y., & Zhao, Y. 2017. Morphological and molecular identification of the new species, *Trichodina pseudoheterodentata* sp.n. (Ciliophora, Mobilida, Trichodinidae) from the channel catfish, *Ictalurus punctatus*, in Chongqing China. *J. Euk. Microb.* 64: 45-55.
- Tantry, TA., Nazir, R., Chishti, MZ., Ahmad, F., Dar, GH., & Dar, JS. 2016. A report on the incidence of *Trichodina heterodentata* from fishes of Jammu, J&K India. *J. Par. Dis.* 40(2): 524-527.
- Tarwiyah, 2001. Pembesaran Ikan Kakap Putih (*Lates calcarifer*) di Keramba Jaring Apung. Direktorat Jenderal Perikanan, Departemen Pertanian. Jakarta. 5 Hal.
- Tavares-Dias, M., Affonso, EG., Olivera, SR., Marcon, JL., & Egani, MI. 2008. Comparative study on hematological parameters of farmed matriona, *Brycon amazonicus* Spix and Agassiz, 1829 (Characidae: Bryconinae) with others Bryconinae species. *Acta Amaz.* 38(4): 799-806.
- Telfer, S., Birtles, R., Bennett, M., Lambin, X., Paterson, S., & Begon, M. 2008. Parasite interactions in natural populations: Insights from longitudinal data. *Parasitol.* 135(7): 767-781. <https://doi.org/10.1017/s0031182008000395>
- Teitelbaum, AB., Yeeting, JK., & Ponia, B. 2010. Aquarium trade in the Pacific. *SPC Live Reef Fish Inf. Bull.* #19 – August 2010.
- Terceti, MS., Ogut, M., & Osorio, CR. 2016. Photobacterium damsela subsp. damsela: an emerging fish pathogen in the Black Sea: evidence of a multiclonal origin. *Appl. Environ. Microbiol.* 82: 3736-3745.

- Thilakaratne, IDSIP., Rajapaksha, G., Hewakopara, A., Rajapakse, RPVJ., & Faizal, ACM. 2003. Parasitic infections in freshwater ornamental fish in Sri Lanka. *Dis. Aqu. Org.* 54(2): 157-162. DOI: 10.3354/dao054157
- Thoney, DA. & Hargis, WJ. 1991. Monogenea (Platyhelminthes) as hazards for fish in confinement. *Ann. Rev. Fish Dis.* 2: 133-153.
- Tierney, KB., Farrel, AP., & Kennedy, CJ. 2004. The differential leucocyte landscape of four teleosts: juvenile *Oncorhynchus kisutch*, *Clupea pallasii*, *Culapea inconstans* and *Pimephales promelas*. *J. Fish Biol.* 65: 906-919.
- Tkachenko, H., Kurhaluk, N., Andriichuk, A., Gasiuk, E., & Beschasniy, S. 2014. Oxidative stress biomarkers in liver of sea trout (*Salmo trutta m. trutta* L.) affected by ulcerative dermal necrosis syndrome. *Turk. J. Fish Aqua. Sci.* 14: 391-402.
- Toranzo, AE., Magarinos, B., & Romalde, JL. 2005. A review of the main bacterial fish diseases in mariculture systems. *Aqua.* 246: 37-61.
- Tort, L. 2011. Stress and immune modulation in fish. *Dev. Comp. Immunol.* 35(12): 1366-1375.
- Triana, H. 2010. Analisis fragmen DNA ikan kerapu macan (*Epinephelus fuscoguttatus*) yang tahan dan rentan terhadap bakteri *Vibrio alginolyticus*. *J. Ilmu Dasar.* 11(1): 8-16.
- Triyaningsih, Sarjito, & Prayitno, SB. 2014. Patogenisitas *Aeromonas hydrophila* yang diisolasi dari Lele Dumbo (*Clarias gariepinus*) yang berasal dari Boyolali. *J. Aqua. Man. Tech.* 3(2): 11-17.
- Trujillo-González, A., Becker, JA., Vaughan, DB., & Hutson, KS. 2018. Monogenean parasites infect ornamental fish imported to Australia. *Parasitol. Res.* 117 (s1): 17 pp. <https://doi.org/10.1007/s00436-018-5776-z>
- Trujillo-González, A., Constantinoiu, CC., Rowe, R., & Hutson, KS. 2015. Tracking transparent monogenean parasites on fish from infection to maturity. *Int. J. Parasitol.* 4(3): 316-322. <https://doi.org/10.1016/j.ij-ppaw.2015.06.002>
- Tu, X., Ling, F., Huang, A., & Wang, G. 2015. An infection of *Gyrodactylus kobayashii* Hukuda, 1940 (Monogenea) associated with the mortality of goldfish (*Carassius auratus*) from central China. *Parasitol. Res.* 114: 737-745
- Tucker, J., Russell, D., & Rimmer, M. 2002. Barramundi Culture: A Success Story for Aquaculture in Asia and Australia, 33. *World Aqua.* Baton Rouge. pp.53-59.
- Tytell, ED. 2006. Median fin function in bluegill sunfish, *Lepomis macrochirus*: Streamwise vortex structure during steady swimming. *J. Exp. Biol.*, 209: 1516-1534.

- Umara, A., Bakri, M., & Hambal, M. 2014. Identifikasi parasit pada ikan gabus (*Channa striata*) di Desa Meunasah Manyang Lamlhom, Kecamatan Lhoknga Aceh Besar. *J. Med. Vet.* 8: 110-112.
- Umasugi, S., & Burhanuddin, A. 2015. Analisis prevalensi dan intensitas ektoparasit ikan kerapu tikus (*Cromileptes altevalis*) di keramba jaring apung Perairan Teluk Kayeli Kabupaten Buru. *J. Agr. Perikan.* 8(1): 13-20 DOI: 10.29239/j.agrikan.8.1.13-20
- UNEP, 2013. Green Economy and Trade – Trends, Challenges and Opportunities.
- Urawa, S., & Arthur, JR. 1991. First record of the parasitic ciliate *Trichodina truttae* Mueller, 1937 on chum salmon fry (*Oncorhynchus keta*) from Japan. *Fish Path.* 26: 83-89.
- Urawa, S., & Yamao, S. 1992. Scanning electron microscopy and pathogenicity of *Chilodonella piscicola* (Ciliophora) on juvenile salmonids. *J. Aqua. An. Health.* 4: 188-197.
- Uribe, C., Folch, H., Enríquez, R., & Moran, G. 2011. Innate and adaptive immunity in teleost fish: A review. *Vet Med* 56(10): 486-503.
- Utami, RH., Setyawan, A., Diantari, R., & Hudaidah, S. 2014. Identifikasi parasit pada ikan badut (*Amphiprion percula*) di Balai Besar Pengembangan Budidaya Laut Lampung. *J. Rek. & Tek. Bud.* 2(2): 1-4.
- Valladao, GM., Gallani, SU., De Padua, SB., Martins, ML., & Pilarski, F. 2014. *Trichodina heterodentata* (Ciliophora) infestation on *Prochilodus lineatus* larvae, a host-parasite relationship study. *Parasitol.* 141: 662-669.
- Vallejos-Vidal E, Reyes-López F, Teles M, & MacKenzie S. 2016. The response of fish to immunostimulant diets. *Fish Shell Immunol.* 56: 34-69.
- Van Dyk, JC., Marchand, MJ., Smit, NJ., & Pieterse, GM. 2009. A histology-based fish health assessment of four commercially and ecologically important species from the Okavango Delta panhandle, Botswana. *Afr. J. Aquat. Sci.* 34: 273-282.
- Vasemägi, A, Visse M, & Kisand V. 2017. Effect of environmental factors and an emerging parasitic disease on gut microbiome of wild salmonid fish. *Am. Soc. Mic. mSphere.* 2(6): e00418-17. <https://doi.org/10.1128/mSphere.00418-17>.
- Vezzulli, L., Chelossi E., Riccardi G., & Fabiano M., 2002 Bacterial community structure and activity in fish farm sediments of the Ligurian sea (Western Mediterranean). *Aqua. Int.* 10: 123-141.

- Villegas, G., & Mulero, V. 2014. Current knowledge on the development and functionality of immune responses in the European seabass (*Dicentrarchus labrax*). pp: Vazquez, F., Cueto, J. (Eds.), Biology of European seabass. CRC Press. Boca Raton, London, New York. pp. 342-373.
- Wang, Z., Zhou, T., & Gu, Z. 2017. New data of two trichodinid ectoparasites (Ciliophora: Trichodinidae) from farmed freshwater fishes in Hubei, China. *Eur. J. Parasitol.* 60: 50-59.
- Wang, Z., Zhou, T., Guo, Q., & Gu, Z. 2016. Description of a new freshwater ciliate *Epistylis wuhanensis* n.sp. (Ciliophora, Peritrichia) from China, with a focus on phylogenetic relationships within family epistylididae. *J. Euk. Microb.* 64(3): 394-406. DOI: 10.1111/jeu.12375
- Whittington, ID., & Ernst, I. 2002. Migration, site-specificity and development of *Benedenia lutjani* (Monogenea: Capsalidae) on the surface of its host, *Lutjanus carponotatus* (Pisces: Lutjanidae). *Parasitol.* 124(4): 423-434. DOI: 10.1017/s0031182001001287
- Widya, NL., Budiharjo, A., & Pangastuti, A. 2016. Bakteri heterotrof aerobik asal saluran pencernaan ikan sidat (*Anguilla bicolor bicolor*) dan potensinya sebagai probiotik. *Biotek.* 13(1): 9-17.
- Wiegertjes, GF., Stet, RJM., Parmentier, HK., & VanMuiswinkel, WB. 1996. Immunogenetics of disease resistance in fish; a comparable approach. *Dev. Comp. Immunol.* 20: 365-381.
- Willem, B., Muiswinkel, V., Geer, F., Wiegertjes., Egberts, E., & Stet, RJM. 1997. Immunogenic of disease resistance on fish. The 7th congress of the ISDCi: session G9 4:00. 21(2): 139-144
- Williams, EH., & Bunkley, LW. 1996. Parasites Off Shore Big Game Fishes of Puerto Rico and The Western Atlantic. Puerto Rico. Department of Natural Environmental Resources and University of Puerto Rico, Rio Piedras.
- Woo, PTK. 2006. Fish Diseases and Disorders, Volume 1: Protozoan and Metazoan Infections Second Edition. CAB Inter. Canada.
- Woo, PTK., & Bruno, DW. 2014. Diseases and Disorders of Finfish in Cage Culture, second Edition. CABI, Boston USA, 342 pp.
- Wood, EM. 2001. Collection of Coral Reef Fish for Aquaria: Global Trade, Conservation Issues and Management Strategies. Marine Conservation Society, Herefordshire, United Kingdom.
- Wootten. R. 1974. The spatial distribution of *Dactylogyrus amphibothrium* on the gills of ruffe *Gymnocephalus cernua* and its relation to the relative amounts of water passing over the parts of the gills. *J. Helminth.* 48: 167-174.
- Xu, DH., Shoemaker, CA., & Klesius, P. 2007. Evaluation of the link between Gyrodactylosis and streptococcosis of Nile tilapia, *Oreochromis niloticus* (L.). *J. Fish Dis.* 30(4): 233-238.

- Xu, DH., Shoemaker, CA., & Klesius, PH. 2009. Enhanced mortality in Nile tilapia *Oreochromis niloticus* following coinfections with *Ichthyophthiriasis* and *Streptococcosis*. *Dis. Aqu. Org.* 85(3): 187-192.
- Xu, DH., Shoemaker, CA., & Klesius, PH. 2012. *Ichthyophthirius multifiliis* as a potential vector of *Edwardsiella ictaluri* in channel catfish. *FEMS Mic. Let.* 329(2): 160-167.
- Xu, DH., Shoemaker, CA., & LaFrentz, BR. 2014. Enhanced susceptibility of hybrid tilapia to *Flavobacterium columnare* after parasitism by *Ichthyophthirius multifiliis*. *Aqua.* 430: 44-49.
- Xu, DH., Shoemaker, CA., & Zhang, D. 2015. Treatment of *Trichodina* sp. reduced load of *Flavobacterium columnare* and improved survival of hybrid tilapia. *Aqua. Reports.* 2: 126-131.
- Xu, K., Song, W., Warren, A., & Choi, JK. 2000. Trichodinid ectoparasites (Ciliophora: Peritrichia) of some marine fishes from coastal regions of the Yellow Sea and Bohai Sea. *Syst. Parasitol.* 50: 69-79.
- Yang, JL., & Chen, HC. 2003. Effects of gallium on common carp (*Cyprinus carpio*): acute test, serum biochemistry and erythrocyte morphology. *Chemosphere* 53:877-882.
- Yanong, RPE. 2016. Lymphocystis disease in fish. IFAS Extension, University of Florida.
- Ye, YW., Fan, TF., Li, H., Lu, JF., Jiang, H., & Hu, W. 2013. Characterization of *Aeromonas hydrophila* from hemorrhagic diseased freshwater fishes in Anhui Province, China. *Int. Food Res. J.* 20(3): 1449-1452.
- Yemmen, C., Quilichini, Y., Ktari, MH., Marchand, B., & Bahri, S. 2010. Morphological, ecological and histopathological studies of *Trichodina gobii* Raabe, 1959 (Ciliophora: Peritrichida) infecting the gills of *Solea aegyptiaca*. *Protistol.* 6(4): 258-263.
- Yemmen, C., Ktari, MH., & Bahri, S. 2011. Seasonality and histopathology of *Trichodina puytoraci* Lom, 1962, a parasite of flathead mullet (*Mugil cephalus*) from Tunisia. *Acta Adriat.* 52(1): 15-20.
- Yifang, C., Shaolin, W., Shuangyang, D., Jianzhong, S., & Zhu, K. 2020. oxins and mobile antimicrobial resistance genes in *Bacillus* probiotics constitute a potential risk for one health. *J. Hazard. Mat.* 382: 121-266.
- You, P., Guo, Z., King, SD., & Cone, DK. 2010. A new gyrodactylid species from *Cobitis granoei* (Rendahl) (Cobitidae) in Central China, *J. Parasitol.* 96: 897–899. <https://doi.org/10.1645/GE-2443.1>.
- Yuwono, T. 2006. Teori dan Aplikasi Polymerase Chain Reaction. Erlangga, Jakarta.

- Zaenuddin, A., Nuraini, L., Faries, A., and Wahyuningsih, S. 2019. Pengendalian penyakit vibriosis pada ikan kakap putih. *J. Perek. Bud. Air Payau & Laut.* 14: 77-83
- Zafran, Roza, D., & Mahardika, K. 2019. Prevalensi ektoparasit pada ikan budidaya di karamba jaring apung di Teluk Kaping, Buleleng, Bali. *J. Fish Mar. Res.* 3(1): 32-40.
- Zafran, Roza, D., Koesharyani, I., Johnny, F., & Yuasa, K. 1998. Manual for Fish Diseases Diagnosis: Marine Fish and Crustacean Diseases in Indonesia. Gondol Research Station for Coastal Fisheries and Japan International Cooperation Agency, 44 pp.
- Zafran, Roza, D., Koesharyani, I., Johnny, F., & Yuasa, K. 2000. Diagnosis and Treatments for Parasitic Diseases, Humpback Grouper, *Cromileptes altivelis* Broodstock. Gondol Research Institut for Fisheries, Bali.
- Zamri-Saad, M., Azmai, MNA., Sitti-Zahrah, A., & Zulkafli, AR. 2014. Control and prevention of streptococcosis in cultured tilapia in Malaysia: A Review. *Pert. J. Trop. Agr. Sci.* 37(4): 389-410
- Zheila, PRN. 2013. Prevalensi dan intensitas *Trichodina* sp. pada benih ikan nila (*Oreochromis niloticus*) di desa tambakrejo, Kabupaten Pacitan. Paper. Fakultas Matematika dan Ilmu Penegtahuan Alam, ITS. Surabaya. pp. 1-11.
- Zhang, X., Shen, Y., Xu, X., Zhang, M., Bai, Y., Miao, Y., Fang, Y., Zhang, J., Wang, R., & Li, J. 2018. Transcriptome analysis and histopathology of black carp (*Mylopharyngodon piceus*) spleen infected by *Aeromonas hydrophila*. *Fish Shell Immunol.* 83: 330-340. DOI: 10.1016/j.fsi.2018.09.047
- Zhuo, LC., Zamhari, DNJBA., Yong, ASK., Shapawi, R., & Lin, YH. 2020. Pathogenicity and histopathology of infectious spleen and kidney necrosis virus genotype II (ISKNV-II) recovering from mass mortality of farmed Asian seabass, *Lates calcarifer*, in Southern China. *Aqua.* 534(8): 1-11.
- Ziętara, MS., & Lumme, J. 2004. Comparison of molecular phylogeny and morphological systematics in fish parasite genus *Gyrodactylus* Nordmann, 1832 (Monogenea, Gyrodactylidae). *Zool. Pol.* 49: 5-28 DOI: 10.1016/j.ecoenv.2003.08.025
- Zorrilla, MA., Chabrillon, AS., Rosales, PD., Manzanares, EM., Balebona, MC., & Morinigo, MA. 2003. Bacteria recovered from diseased cultured gilthead seabream (*Sparus aurata*) in southwestern Spain. *Aqua.* 218: 11-20.

LAMPIRAN

Lampiran 1. Uji Kruskal-Wallis Infestasi *Gyrodactylus* sp. berdasarkan sirip

Ranks

	sirip	N	Mean Rank
numberparasite	siripekor	30	104.87
	sirippunggung	30	32.73
	siripdubur	30	45.42
	siripperut	30	58.98
	Total	120	

Test Statistics^{a,b}

numberparasite	
Kruskal-Wallis H	73.989
df	3
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: sirip

Lampiran 2. Regresi liner infestasi *Gyrodactylus* sp. terhadap interval berat ikan

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,982328
R Square	0,964969
Adjusted R Square	0,947453
Standard Error	0,295935
Observations	4

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	4,824844	4,824844	55,09211	0,017672
Residual	2	0,175156	0,087578		
Total	3	5			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,580525	0,297945	1,948429	0,190706	-0,70143	1,862479	-0,70143	1,862479
X Variable 1	0,004024	0,000542	7,422406	0,017672	0,001691	0,006357	0,001691	0,006357

Lampiran 3. Uji Kruskal-Wallis intensitas *Gyrodactylus* sp. berdasarkan interval panjang ikan

Ranks			
	kelaspanjang	N	Mean Rank
prevalensi	1-2 cm	4	6.00
	2.5-3.6	4	3.00
Total		8	

Test Statistics^{a,b}

prevalensi	
Kruskal-Wallis H	3.000
df	1
Asymp. Sig.	.083

a. Kruskal Wallis Test

b. Grouping Variable:

kelaspanjang

Lampiran 4. Regresi linier infestasi *Trichodina* sp. terhadap interval panjang ikan dari Takalar

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,999613
R Square	0,999225
Adjusted R Square	0,99845
Standard Error	0,039366
Observations	3

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	1,99845	1,99845	1289,613	0,017723
Residual	1	0,00155	0,00155		
Total	2	2			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,650564	0,043916	14,81395	0,042909	0,092563	1,208565	0,092563	1,208565
X Variable 1	0,006426	0,000179	35,91119	0,017723	0,004152	0,0087	0,004152	0,0087

Lampiran 5. Regresi linier Infestasi *Trichodina* sp. terhadap interval panjang ikan dari Situbondo

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,996208							
R Square	0,99243							
Adjusted R Square	0,984859							
Standard Error	0,123049							
Observations	3							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1,984859	1,984859	131,0918	0,054462			
Residual	1	0,015141	0,015141					
Total	2	2						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-2,51825	0,400967	-6,28045	0,100522	-7,61302	2,576517	-7,61302	2,576517
X Variable 1	0,0039	0,000341	11,44953	0,055462	-0,00043	0,008227	-0,00043	0,008227

Lampiran 6. Regresi linier Infestasi *Trichodina* sp. terhadap interval berat ikan dari Takalar

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,766899							
R Square	0,588135							
Adjusted R Square	0,17627							
Standard Error	0,907596							
Observations	3							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1,17627	1,17627	1,427979	0,443597			
Residual	1	0,82373	0,82373					
Total	2	2						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	4,775468	2,380981	2,005673	0,294447	-25,4778	35,02869	-25,4778	35,02869
X Variable 1	-0,01322	0,01106	-1,19498	0,443597	-0,15375	0,127314	-0,15375	0,127314

Lampiran 7. Regresi linier Infestasi *Trichodina* sp. terhadap interval berat ikan dari Situbondo

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,69675
R Square	0,48546
Adjusted R Square	-0,02908
Standard Error	1,014435
Observations	3

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0,970921	0,970921	0,943485	0,509257
Residual	1	1,029079	1,029079		
Total	2	2			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	5,640691	3,793628	1,486886	0,376919	-42,5619	53,84331	-42,5619	53,84331
X Variable 1	-0,00314	0,003235	-0,97133	0,509257	-0,04425	0,037961	-0,04425	0,037961

Lampiran 8. Regresi linier Infestasi *Trichodina* sp. terhadap interval berat ikan dari Gondol

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,998899							
R Square	0,997799							
Adjusted R Square	0,995599							
Standard Error	0,06634							
Observations	3							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1,995599	1,995599	453,436	0,029875			
Residual	1	0,004401	0,004401					
Total	2	2						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,153991	0,094776	1,624801	0,351229	-1,05025	1,358229	-1,05025	1,358229
X Variable 1	0,009548	0,000448	21,29404	0,029875	0,003851	0,015246	0,003851	0,015246

Lampiran 9. Regresi linier Infestasi *Trichodina* sp. terhadap interval panjang ikan dari Gondol

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,902218							
R Square	0,813998							
Adjusted R Square	0,627996							
Standard Error	0,609921							
Observations	3							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1,627996	1,627996	4,376286	0,283875			
Residual	1	0,372004	0,372004					
Total	2	2						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	5,384364	1,655679	3,252059	0,189917	-15,653	26,42175	-15,653	26,42175
X Variable 1	-0,01751	0,008368	-2,09196	0,283875	-0,12383	0,088819	-0,12383	0,088819

Lampiran 10. Regresi linier prevalensi *Trichodina* sp. berdasarkan kelompok ukuran ikan yang diuji

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,649344							
R Square	0,421648							
Adjusted R Square	0,363813							
Standard Error	2,875837							
Observations	12							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	60,29563	60,29563	7,290502	0,02231			
Residual	10	82,70437	8,270437					
Total	11	143						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	8,051913	1,00973	7,97432	1,21E-05	5,802094	10,30173	5,802094	10,30173
X Variable 1	-0,06106	0,022614	-2,70009	0,02231	-0,11145	-0,01067	-0,11145	-0,01067

Lampiran 11. Regresi linier intensitas *Trichodina* sp. berdasarkan kelompok ukuran ikan yang diuji

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,623633							
R Square	0,388918							
Adjusted R Square	0,32781							
Standard Error	2,95609							
Observations	12							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	55,61532	55,61532	6,364424	0,030243			
Residual	10	87,38468	8,738468					
Total	11	143						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	8,039953	1,049198	7,66295	1,71E-05	5,702194	10,37771	5,702194	10,37771
X Variable 1	-0,70802	0,280652	-2,52278	0,030243	-1,33336	-0,08269	-1,33336	-0,08269

Lampiran 12. Uji Kruskal-Wallis jumlah bakteri berdasarkan tingkat infeksi parasit

Ranks			
	infection_rate	N	Mean Rank
number_ofbacteria	light	9	9.78
	moderate	9	10.11
	heavy	4	18.50
	Total	22	

Test Statistics^{a,b}	
	number_ofbacteria
Kruskal-Wallis H	6.501
df	2
Asymp. Sig.	.039

a. Kruskal Wallis Test

b. Grouping Variable: infection_rate

Lampiran 13. Kruskal-Wallis jumlah bakteri berdasarkan panjang ikan

Ranks

	fishlength	N	Mean Rank
numberofbacteria	9.5	4	17.00
	8.5	4	9.75
	7.1	4	8.00
	6.5	4	12.75
	2.8	4	5.00
	Total	20	

Test Statistics^{a,b}

bactnumberofbacteria	
Kruskal-Wallis H	10.599
df	4
Asymp. Sig.	.031

a. Kruskal Wallis Test

b. Grouping Variable: fishlength

Lampiran 14. Kruskal-Wallis infestasi parasit berdasarkan panjang ikan

Ranks			
	fishlengthinterval	N	Mean Rank
parasitesnumber	1-3.5	5	5.00
	3.6-7.0	5	7.20
	7.1-9.5	4	11.00
	Total	14	

Test Statistics^{a,b}

	parasitesnumber
Kruskal-Wallis H	6.263
df	2
Asymp. Sig.	.044

a. Kruskal Wallis Test

b. Grouping Variable:

fishlengthinterval

Lampiran 15. Patogenisitas bakteri

Patogenisitas bakteri pada ikan sehat (tidak terinfeksi *Trichodina* sp.)

Bakteri	Perlakuan (Cfu/mL)	ΣIkan (Ind.)			Mortalitas		LC ₅₀
		Diperiksa	Mati	Hidup	Rasio	%	
<i>A. caviae</i>	1,3 x 10 ⁹	30	5	25	5/30	16,67	6,0
	1,3 x 10 ⁷	30	2	28	2/30	6,67	
	1,3 x 10 ⁵	30	1	29	1/30	3,33	
	Kontrol	30	0	30	0/30	0,00	
<i>Ps. aeruginosa</i>	1,3 x 10 ⁹	30	4	26	4/30	13,33	8,1
	1,3 x 10 ⁷	30	1	29	1/30	3,33	
	1,3 x 10 ⁵	30	0	30	0/30	0,00	
	Kontrol	30	0	30	0/30	0,00	
<i>Ph. damsela</i>	1,3 x 10 ⁹	30	5	25	5/30	16,67	7,6
	1,3 x 10 ⁷	30	2	28	2/30	6,67	
	1,3 x 10 ⁵	30	0	30	0/30	0,00	
	Kontrol	30	0	30	0/30	0,00	

Patogenisitas bakteri pada ikan yang terinfeksi *Trichodina* sp.

Bakteri	Perlakuan (Cfu/mL)	ΣIkan (Ind.)			Mortalitas		LC ₅₀
		Diperiksa	Mati	Hidup	Rasio	%	
<i>A. caviae</i>	1,3 x 10 ⁹	30	9	21	9/30	30,00	5,0
	1,3 x 10 ⁷	30	7	23	7/30	23,33	
	1,3 x 10 ⁵	30	3	27	3/30	10,00	
	Kontrol	30	0	30	0/30	0,00	
<i>Ps. aeruginosa</i>	1,3 x 10 ⁹	30	7	23	7/30	23,33	7,4
	1,3 x 10 ⁷	30	2	28	2/30	6,67	
	1,3 x 10 ⁵	30	0	30	0/30	0,00	
	Kontrol	30	0	30	0/30	0,00	
<i>Ph. damsela</i>	1,3 x 10 ⁹	30	6	24	6/30	20,00	6,1
	1,3 x 10 ⁷	30	5	25	5/30	16,67	
	1,3 x 10 ⁵	30	1	29	1/30	3,33	
	kontrol	30	0	30	0/30	0,00	

Lampiran 16. Regresi linier persen mortalitas ikan pada semua perlakuan

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,327488
R Square	0,107248
Adjusted R Square	0,066669
Standard Error	6,831293
Observations	24

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	123,3356	123,3356	2,642911	0,118254
Residual	22	1026,664	46,66657		
Total	23	1150			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	10,43058	1,88807	5,52447	1,49E-05	6,514967	14,3462	6,514967	14,3462
X Variable 1	0,24833	0,152752	1,625703	0,118254	-0,06846	0,565119	-0,06846	0,565119

Lampiran 17. Regresi linier persen mortalitas ikan pada infeksi tunggal dan koinfeksi dengan *Aeromonas caviae*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,795562							
R Square	0,632919							
Adjusted R Square	0,571739							
Standard Error	1,602986							
Observations	8							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	26,58261	26,58261	10,34518	0,01822			
Residual	6	15,41739	2,569564					
Total	7	42						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	2,528126	0,834895	3,028075	0,023155	0,485211	4,571042	0,485211	4,571042
X Variable 1	0,175278	0,054495	3,216393	0,01822	0,041933	0,308622	0,041933	0,308622

Lampiran 18. Regresi persen mortalitas ikan pada infeksi tunggal dan koinfeksi dengan *Pseudomonas aeruginosa*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,59487							
R Square	0,35387							
Adjusted R Square	0,246181							
Standard Error	2,126714							
Observations	8							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	14,86253	14,86253	3,286054	0,119818			
Residual	6	27,13747	4,522911					
Total	7	42						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	3,499819	0,932626	3,752651	0,00948	1,217766	5,781872	1,217766	5,781872
X Variable 1	0,171484	0,094599	1,812748	0,119818	-0,05999	0,40296	-0,05999	0,40296

Lampiran 19. Regresi linier persen mortalitas ikan pada infeksi tunggal dan koinfeksi dengan *Photobacterium damsela*

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,671948
R Square	0,451514
Adjusted R Square	0,360099
Standard Error	1,95944
Observations	8

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	18,96357	18,96357	4,939196	0,06797
Residual	6	23,03643	3,839405		
Total	7	42			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	2,973059	0,975692	3,047128	0,022595	0,585626	5,360493	0,585626	5,360493
X Variable 1	0,192856	0,086777	2,22243	0,06797	-0,01948	0,405193	-0,01948	0,405193

Lampiran 20. Regresi linier eritrosit pada semua perlakuan bakteri

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,755738							
R Square	0,57114							
Adjusted R Square	0,499663							
Standard Error	1,732635							
Observations	8							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	23,98786	23,98786	7,990566	0,030086			
Residual	6	18,01214	3,002023					
Total	7	42						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	16,01509	4,119402	3,887721	0,008098	5,935272	26,0949	5,935272	26,0949
X Variable 1	-1,82417	0,645323	-2,82676	0,030086	-3,40322	-0,24512	-3,40322	-0,24512

Lampiran 21. Regresi linier leukosit pada semua perlakuan bakteri

SUMMARY OUTPUT 2

<i>Regression Statistics</i>	
Multiple R	0,285273
R Square	0,08138
Adjusted R Square	-0,07172
Standard Error	2,535811
Observations	8

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	3,417978	3,417978	0,531539	0,493425
Residual	6	38,58202	6,430337		
Total	7	42			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	2,265169	3,193749	0,709251	0,504782	-5,54965	10,07999	-5,54965	10,07999
X Variable 1	0,438202	0,601045	0,729067	0,493425	-1,0325	1,908906	-1,0325	1,908906

Lampiran 22. Regresi linier limfosit darah ikan pada infeksi tunggal dan koinfeksi dengan *Aeromonas caviae*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R		0,84639						
R Square		0,716376						
Adjusted R Square		0,64547						
Standard Error		1,113936						
Observations		6						
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	12,53658	12,53658	10,10318	0,033582			
Residual	4	4,963418	1,240855					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-5,50991	2,870846	-1,91926	0,127379	-13,4807	2,460832	-13,4807	2,460832
X Variable 1	0,144932	0,045597	3,178551	0,033582	0,018335	0,271528	0,018335	0,271528

Lampiran 23. Regresi linier monosit darah ikan pada infeksi tunggal dan koinfeksi dengan *Aeromonas caviae*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,852109							
R Square	0,72609							
Adjusted R Square	0,657612							
Standard Error	1,094695							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	12,70657	12,70657	10,60332	0,03119			
Residual	4	4,793431	1,198358					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	7,649957	1,350536	5,664385	0,00479	3,900267	11,39965	3,900267	11,39965
X Variable 1	-0,2567	0,078832	-3,25627	0,03119	-0,47557	-0,03783	-0,47557	-0,03783

Lampiran 24. Regresi linier neutrofil darah ikan pada infeksi tunggal dan koinfeksi dengan *Pseudomonas aeruginosa*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,827349							
R Square	0,684507							
Adjusted R Square	0,605634							
Standard Error	1,174854							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	11,97887	11,97887	8,678571	0,042139			
Residual	4	5,521127	1,380282					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	13,83099	3,539501	3,907609	0,017429	4,003755	23,65822	4,003755	23,65822
X Variable 1	-0,38028	0,129087	-2,94594	0,042139	-0,73868	-0,02188	-0,73868	-0,02188

Lampiran 25. Regresi linier basofil darah ikan pada semua perlakuan

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,74563
R Square	0,55597
Adjusted R Square	0,48196
Standard Error	1,76302
Observations	8

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	23,3506	23,350599	7,512499	0,0336958
Residual	6	18,6494	3,1082335		
Total	7	42			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	3,51639	0,71924	4,889012	0,002741	1,7564663	5,27632	1,7564663	5,2763204
X Variable 1	0,30654	0,11184	2,7408937	0,033696	0,0328786	0,5802	0,0328786	0,5801991

Lampiran 26. Parameter imun (titer antibodi dan globulin)

Titer antibodi (log₂) pada darah kakap putih yang terinfeksi oleh *Trichodina* sp.

Perlakuan	2	4	8	16	32	64	128	256	512	1024	2048	Log ₂
Kontrol 1	-	-	-	-	-	-	-	-	-	-	-	0,00
Kontrol 2	-	-	-	-	-	-	-	-	-	-	-	0,00
Kontrol 3	-	-	-	-	-	-	-	-	-	-	-	0,00
<i>A. caviae</i> 1	+	+	+	+	+	+	+	-	-	-	-	4,21
<i>A. caviae</i> 2	+	+	+	+	+	+	+	-	-	-	-	3,61
<i>A. caviae</i> 3	+	+	+	+	+	+	-	-	-	-	-	3,01
<i>Ps. aeruginosa</i> 1	+	+	+	+	+	+	+	-	-	-	-	3,61
<i>Ps. aeruginosa</i> 2	+	+	+	+	+	+	+	-	-	-	-	2,41
<i>Ps. aeruginosa</i> 3	+	+	+	+	+	-	-	-	-	-	-	2,41
<i>Ph. damsela</i> 1	+	+	+	+	+	+	+	-	-	-	-	3,61
<i>Ph. damsela</i> 2	+	+	+	+	+	-	-	-	-	-	-	2,41
<i>Ph. damsela</i> 3	+	+	+	+	+	+	-	-	-	-	-	3,01

Titer antibodi (log₂) pada darah kakap putih yang tidak terinfeksi *Trichodina* sp.

Perlakuan	2	4	8	16	32	64	128	256	512	1024	2048	Log ₂
Kontrol 1	-	-	-	-	-	-	-	-	-	-	-	0,00
Kontrol 2	-	-	-	-	-	-	-	-	-	-	-	0,00
Kontrol 3	-	-	-	-	-	-	-	-	-	-	-	0,00
<i>A. caviae</i> 1	+	+	+	+	+	+	+	-	-	-	-	3,01
<i>A. caviae</i> 2	+	+	+	+	+	+	-	-	-	-	-	3,01
<i>A. caviae</i> 3	+	+	+	+	+	+	-	-	-	-	-	2,41
<i>Ps. aeruginosa</i> 1	+	+	+	+	+	-	-	-	-	-	-	3,01
<i>Ps. aeruginosa</i> 2	+	+	+	+	+	-	-	-	-	-	-	2,41
<i>Ps. aeruginosa</i> 3	+	+	+	+	+	+	-	-	-	-	-	2,41
<i>Ph. damsela</i> 1	+	+	+	+	+	-	-	-	-	-	-	2,41
<i>Ph. damsela</i> 2	+	+	+	+	+	+	-	-	-	-	-	3,01
<i>Ph. damsela</i> 3	+	+	+	+	+	+	-	-	-	-	-	1,81

Globulin (g/dL) pada darah ikan kakap putih setelah eksperimen koinfeksi

Perlakuan	Ulangan	Infeksi tunggal	Koinfeksi
Kontrol	1	2,15	1,32
	2	2,40	1,44
	3	2,04	1,24
<i>A. caviae</i>	1	3,27	2,31
	2	3,00	2,52
	3	2,85	2,59
<i>Ps. aeruginosa</i>	1	2,68	1,15
	2	2,20	1,38
	3	1,20	1,20
<i>Ph. damsela</i>	1	2,63	1,85
	2	1,51	1,41
	3	1,09	1,52

Lampiran 27. Regresi linier rata-rata antibodi pada semua perlakuan bakteri

SUMMARY OUTPUT rata2 antarbakteri

<i>Regression Statistics</i>	
Multiple R	0,879834
R Square	0,774107
Adjusted R Square	0,717634
Standard Error	0,994123
Observations	6

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	13,54688	13,54688	13,70751	0,020792
Residual	4	3,953125	0,988281		
Total	5	17,5			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	14,92188	3,111602	4,79556	0,008676	6,282682	23,56107	6,282682	23,56107
X Variable 1	-3,97074	1,072488	-3,70237	0,020792	-6,94845	-0,99304	-6,94845	-0,99304

Lampiran 28. Regresi linier titer antibodi pada infeksi tunggal dan koinfeksi dengan injeksi *Aeromonas caviae*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,931589							
R Square	0,867857							
Adjusted R Square	0,834821							
Standard Error	0,760345							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	15,1875	15,1875	26,27027	0,00686			
Residual	4	2,3125	0,578125					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	12,5	1,783168	7,009996	0,00218	7,549132	17,45087	7,549132	17,45087
X Variable 1	-2,80288	0,546854	-5,12545	0,00686	-4,32119	-1,28457	-4,32119	-1,28457

Lampiran 29. Regresi linier titer antibodi pada infeksi tunggal dan koinfeksi dengan *Pseudomonas aeruginosa*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,574989							
R Square	0,330612							
Adjusted R Square	0,163265							
Standard Error	1,711307							
Observations	6							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	5,785714	5,785714	1,97561	0,232566			
Residual	4	11,71429	2,928571					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	9,285714	4,175161	2,224037	0,090206	-2,30639	20,87782	-2,30639	20,87782
X Variable 1	-2,13553	1,519337	-1,40556	0,232566	-6,35388	2,082831	-6,35388	2,082831

Lampiran 30. Regresi linier titer antibodi pada infeksi tunggal dan koinfeksi dengan *Photobacterium damsela*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,662541							
R Square	0,438961							
Adjusted R Square	0,298701							
Standard Error	1,566699							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	7,681818	7,681818	3,12963	0,151603			
Residual	4	9,818182	2,454545					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	8,818182	3,07348	2,869119	0,045509	0,284833	17,35153	0,284833	17,35153
X Variable 1	-1,96296	1,109595	-1,76908	0,151603	-5,04369	1,117772	-5,04369	1,117772

Lampiran 31. Regresi linier globulin pada semua perlakuan bakteri

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,535853
R Square	0,287139
Adjusted R Square	0,254736
Standard Error	6,104358
Observations	24

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	330,2098	330,2098	8,861553	0,006958
Residual	22	819,7902	37,26319		
Total	23	1150			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	23,47194	3,8907	6,032832	4,51E-06	15,40312	31,54076	15,40312	31,54076
X Variable 1	-5,60866	1,884101	-2,97684	0,006958	-9,51604	-1,70127	-9,51604	-1,70127

Lampiran 32. Regresi linier globulin ikan sehat dan ikan terinfeksi *Trichodina* sp.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,886894
R Square	0,786582
Adjusted R Square	0,733227
Standard Error	0,966284
Observations	6

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	13,76518	13,76518	14,74254	0,018466
Residual	4	3,73482	0,933705		
Total	5	17,5			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	9,462096	1,602116	5,905999	0,004114	5,013909	13,91028	5,013909	13,91028
X Variable 1	-3,37796	0,879768	-3,8396	0,018466	-5,82059	-0,93533	-5,82059	-0,93533

Lampiran 33. Regresi linier globulin pada infeksi tunggal dan koinfeksi dengan *Aeromonas caviae*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,820144							
R Square	0,672635							
Adjusted R Square	0,590794							
Standard Error	1,196754							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	11,77112	11,77112	8,218794	0,045613			
Residual	4	5,72888	1,43222					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	15,56285	4,235979	3,673966	0,021317	3,801882	27,32381	3,801882	27,32381
X Variable 1	-4,37588	1,526376	-2,86684	0,045613	-8,61378	-0,13798	-8,61378	-0,13798

Lampiran 34. Regresi linier globulin pada infeksi tunggal dan koinfeksi dengan *Pseudomonas aeruginosa*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,819326							
R Square	0,671295							
Adjusted R Square	0,589119							
Standard Error	1,199202							
Observations	6							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	11,74766	11,74766	8,168964	0,046016			
Residual	4	5,752339	1,438085					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	7,376373	1,441913	5,115684	0,006907	3,372979	11,37977	3,372979	11,37977
X Variable 1	-2,37087	0,829515	-2,85814	0,046016	-4,67397	-0,06777	-4,67397	-0,06777

Lampiran 35. Regresi linier globulin pada infeksi tunggal dan koinfeksi dengan *Photobacterium damsela*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R		0,513054						
R Square		0,263225						
Adjusted R Square		0,079031						
Standard Error		1,795381						
Observations		6						
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	4,60643	4,60643	1,429063	0,297943			
Residual	4	12,89357	3,223392					
Total	5	17,5						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	6,51967	2,630195	2,478779	0,0683	-0,78292	13,82226	-0,78292	13,82226
X Variable 1	-1,80999	1,514088	-1,19543	0,297943	-6,01377	2,393789	-6,01377	2,393789

Lampiran 36. Regresi linier kuantifikasi histopatologi antarperlakuan pada infeksi tunggal

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,646034
R Square	0,417361
Adjusted R Square	0,364393
Standard Error	3,10484
Observations	13

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	75,95962	75,95962	7,879601	0,017058
Residual	11	106,0404	9,640034		
Total	12	182			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	10,30653	1,459132	7,063466	2,09E-05	7,095003	13,51806	7,095003	13,51806
X Variable 1	-0,58883	0,209769	-2,80706	0,017058	-1,05053	-0,12714	-1,05053	-0,12714

Lampiran 37. Regresi linier alterasi organ antarperlakuan pada koinfeksi

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,611307
R Square	0,373696
Adjusted R Square	0,321504
Standard Error	3,44582
Observations	14

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	85,01588	85,01588	7,160029	0,020192
Residual	12	142,4841	11,87368		
Total	13	227,5			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	12,59619	2,115505	5,954224	6,67E-05	7,986901	17,20548	7,986901	17,20548
X Variable 1	-0,66679	0,249191	-2,67582	0,020192	-1,20973	-0,12385	-1,20973	-0,12385

Lampiran 38. Regresi linier alterasi organ semua perlakuan pada infeksi tunggal dan koinfeksi

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,38842							
R Square	0,15087							
Adjusted R Square	0,116905							
Standard Error	7,458886							
Observations	27							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	247,1256	247,1256	4,44191	0,045264			
Residual	25	1390,874	55,63498					
Total	26	1638						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	8,99239	2,775952	3,239389	0,003373	3,275209	14,70957	3,275209	14,70957
X Variable 1	0,751142	0,356399	2,107584	0,045264	0,017123	1,48516	0,017123	1,48516