

DAFTAR PUSTAKA

- Abedi, Z., Hasantabar, F., Khalesi, M. K., Babaei, S. 2013. Effect of Sublethal Concentrations of Cadmium, Lead and Chromium on Some Enzymatic Activities of Common Carp; *Cyprinus carpio*. *World Journal of Zoology*, 8 (1): 98-105p.
- Adhani, R., dan Husaini. 2017. Logam Berat Sekitar Manusia, Cetakan II. Lambung Mangkurat University Press. Banjarmasin. ISBN: 978-602-6483-47-8 hal.
- Almeida, J.A., Barreto, R.E., Novelli, L.B., Castro, F.J., Moron, S.E. 2009. Oxidative Stress Biomarkers and Aggressive Behavior in Fish Exposed to Aquatic Cadmium Contamination. *Neotropical Ichthyology*, 7: 103-108p.
- Amutha, C., and Subramanian, P. 2013. Cadmium alters the reproductive endocrine disruption and enhancement of growth in the early and adult stages of *Oreochromis mossambicus*. *Fish Physiol Biochem*, 39: 351–361p.
- Andriani, Y., Akbar, F.K., Zahidah., Rostika, R., Haetami, K., Junianto. 2019. Nilem Carp Fish (*Osteochilus hasselti*) Performance in Various Feed Energy-Protein Ratios. *Asian Journal of Research In Zoology*, 2(1): 1-8p.
- Anwar, D., Abdul, W.A., Anwar, M. 2014. *Analisis Risiko Lingkungan Logam Berat Cadmium (Cd) pada Sedimen Air Laut di Wilayah Pesisir Kota Makassar*. Skripsi. Fakultas Kesehatan Masyarakat, Universitas Hasanuddin.
- Arcand-Hoy, L.D., and Benson, W.H. 1998. Fish Reproduction: an Ecologically Relevant Indicator of Endocrine Disruption. *Environmental Toxicology and Chemistry*, 17(1): 49-57p.
- Betawi, A.S. 2012. *Analisis kadar Logam Kadmium (Cd) yang teradsorpsi pada Rumput Laut Merah (Euchema cottonii) di Kabupaten Takalar dengan Metode Spektrofotometer Serapan Atom (SSA)*. Skripsi. Fakultas Sains dan Teknologi, UIN Alauddin Makassar. Makassar.
- Brodeur, J.C., Daniel, C., Ricard, A.C., Hontela, A. 1998. In Vitro Response to ACTH of The Interrenal Tissue of Rainbow Trout (*Oncorhynchus mykiss*) exposed to Cadmium. *Aquat. Toxicol*, 42: 103-113p.
- Chinabut, S., Limsuwan, L.C., Kitsawat, P. 1991. Histology of the Walking Catfish (*Clarias batrachus*). International Development Research Centre. Canada.
- Cholik, F., Ateng, G. J., Poernomo., Jauzi, A. 2005. Akuakultur. PT Victoria Kreasi Mandiri. Jakarta.
- Darmono. 2001. Lingkungan Hidup dan Pencemaran, Hubungannya dengan Toksikologi Senyawa Logam. UI Press. Jakarta.
- Das, S., and Mukherjee, D. 2013. Effect of Cadmium Chloride on Secretion of 17b-Estradiol by The Ovarian Follicles of Common Carp, *Cyprinus carpio*. *General And Comparative Endocrinology*, 181 : 107-114p.

- Dewi, N.K., Purwanto., Sunoko, H.R. 2014. Metallothionein pada hati ikan sebagai biomarker pencemaran kadmium (Cd) di perairan Kaligarang Semarang. *J. Manusia dan Lingkungan*, 21(3): 304-309 hal.
- Dewi, K.N., Prabowo, R., Trimartuti, N.K. 2014. Analisis Kualitas Fisiko Kimia dan Kadar Logam Berat pada Ikan Mas (*Cyprinus carpio L.*) dan Ikan Nila (*Oreochromis niloticus L.*) di Perairan Kaligarang Semarang. *Biosaintifika*, 6(2): 133-140 hal.
- Dewi, K.N. 2018. Efek Paparan Logam Berat terhadap Kadar Malondialdehida dan Aktivitas Katalase Ikan Mas dan Ikan Nila di Sungai Kaligarang. *Jurnal Mipa*, 41(2): 69-75 hal.
- Djuhanda. 1994. Pengantar Anatomi Perbandingan Vertebrata 2. PT Armico. Bandung.
- Effendie, M. I. 1979. Metode Biologi Perikanan. Yayasan Dewi Sri. Bogor. 112 hal.
- Faqih, A. 2013. Ikan Nilem Transgenik. UB Press. Malang
- Flagellata, P., Sri, W., Muhammad, J., Hammy., Gholib., Armansyah, T.T.R., Muslim, A. 2018. Immunohistochemical Study of the Immunoreactive Follicle Stimulating Hormone (ir-FSH) Cells Distribution in Pituitary Gland of Rat (*Rattus norvegicus*). *Jurnal Medika Veterinaria*, 12(1) : 1-8p.
- Flora, S. J. S. 2009. Metal Poisoning: Treatment and Management. Review Article. Al Ameen. *J. Med. Sci*, 2: 4-26p.
- Gautam, G.J., and Chaube, R. 2018. Differential Effects of Heavy Metals (Cadmium, Cobalt, Lead and Mercury) on Oocyte Maturation and Ovulation of the Catfish *Heteropneustes fossilis*: an In Vitro Study. *Turkish Journal of Fisheries and Aquatic Sciences*, 18: 1205-1214p.
- Geneaid. 2017.Total RNA Mini Kit Protocol. Geneaid Biotech Ltd. New Taipei, Taiwan.
- Ginanjar, M. 2006. *Kajian Reproduksi Ikan Lemuru (Sardinella Lemuru Blk.) berdasarkan Perkembangan Gonad dan Ukuran Ikan dalam Penentuan Musim Pemijahan di Perairan Pantai Timur Pulau Siberut*. Thesis. Institut Pertanian Bogor, Bogor.
- Guzman, J. M., Bayarri, M. J., Ramos, J., Zohar, Y., Sarasquete, C., Mananos, E. L. 2009. Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) gene expression during larval development in Senegalese sole (*Solea senegalensis*). *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, 154(1): 37-43p.
- Hachfi, L., Couvray, S., Simide, R. 2012. Impact of endocrine disrupting chemicals (EDCs) on hypothalamic- pituitary - gonad - liver (HPGL) axis in fish. *World Journal of Fish and Marine Sciences*, 4(1): 14 - 30p.
- Hadi, M.I., Agustina, E., Andiarna, F., Nadlir., Munir, M. 2019. Pengaruh Kompleks Linier Alkylbenzene Sulfonate (LAS) dan Kadmium (Cd)

- terhadap Peningkatan Akumulasi, Absorbsi, dan Toksisitas Kadmium (Cd) pada Ikan Mas (*Cyprinus carpio* L). *Jurnal Teknik Lingkungan*, 4(2): 28–35 hal.
- Hardjamulia, A., dan Atmawinata, S. 1980. Teknik hipofisasi beberapa jenis ikan air tawar. Prosiding Seminar Penelitian. Lokakarya Nasional Teknologi Tepat Guna Bagi Pengembangan Perikanan Budidaya Air Tawar. Bogor. 1–16 hal.
- Hariani, D., dan Kusuma, P. S. W. 2009. Biostimuli Reproduksi Ikan Lele Dumbo (*Clarias Gariepinus*) Betina dengan Penembakan Laserpunktur. Berk. Penel. Hayati Edisi Khusus, 3D: 79 – 83 hal.
- Hariani, D., dan Kusuma, P.S.W. 2017. Efektifitas Induksi Laserpunktur dan Ovaprim terhadap Kecepatan Pemijahan dan Jumlah Telur yang terbuahi pada Induk Lele (*Clarias sp*). *Journal of science*, Vol. 9(2): 1–5 hal.
- Hayati, A., Pratiwi, H., Khairiyah, I., Winarni, D., Sugiharto. 2016. Histopathological Assessment of Cadmium Effect on Testicles and Kidney of *Oreochromis niloticus* in Different Salinity. Proceeding of International Biology Conference, 1–8p.
- IMPLEN. 2011. NanoPhotometer® P-Class User Manual P 300 / P 330 / P 360 Version 2.1. Implen Inc, Los Angeles County, USA. 1–70p.
- Julhidah. 2017. *Kadar Logam Kadmium (Cd) dan Timbal (Pb) pada Hati, Ginjal dan Daging Ikan Kembung (Rastraliger Kanagurta) di Pantai Losari Makassar*. Skripsi. Fakultas Sains dan Teknologi, UIN Alauddin Makassar. Makassar.
- KAPABIOSYSTEM. 2017. *KAPA SYBR® FAST One-Step qRT-PCR Master Mix (2X) Kit protocol*. Manufacturing, R&D Cape Town, South Africa.
- Lindawati. 2017. *Absorbsi Logam Berat Kadmium (Cd) pada Cumi -cumi (Loligo sp) di Pulau Lae-Lae*. Skripsi. Fakultas Sains dan Teknologi. UIN Alauddin Makassar. Makassar.
- Livak, K.J., and Schmittgen, T.D. 2001. Analysis of Relative Gene Expression Data Using RealTime Quantitative PCR and the 2^{DDCT} Method. *METHODS*, 25: 402 – 408p.
- Kasherwani, D., Lodhi, H.S., Tiwari, K.J., Shukla, S., Sharma, U.D. 2009. Cadmium Toxicity To Freshwater Catfish, *Heteropneustes fossilis* (Bloch). *Asian J. Exp. Sci.*, Vol. 23(1): 149-156p.
- Kovacik, A. 2017. Oxidative Stress in Fish Induced by Environmental Pollutants. *Animal Science And Biotechnologies*, 50 (1): 121-125p.
- Madigan, M.T., Martinko, J.M., Dunlap, P.V., Clark, D.P. 2009. Brock: Biology of Microorganism. 12th ed. Pearson Education, San Fransisco. 36p.
- Morcillo, P., Esteban, M.A., Cuesta,A. 2017. Mercury and its toxic effects on fish. *AIMS Environmental Science*, 4(3): 386-402p.
- Norris, D.O. 2000, Endocrine Disruptors of the Stress Axis in Natural Populations: How Can We Tell?. *AMER ZOOL.*, 40: 393–401p.

- Pait, A.S., and Nelson, J.O. 2002. Endocrine Disruption in Fish: An Assessment of Recent Research and Results. NOAA Tech. Memo. NOS NCCOS CCMA 149. Silver Spring, MD: NOAA, NOS, Center for Coastal Monitoring and Assessment 55p.
- Pal, M., Horvarth, E., Janda, T., Paldi, E., Szalai, G. 2006. Physiological Changes and Defense Mechanism Induced by Cadmium Stress in Maize. *J. Plant. Nutr. Soil Sci*, 159: 230-246p.
- Palar, H. 2004. Pencemaran dan Toksikologi Logam Berat. PT. Rineka Cipta. Jakarta.
- Peraturan Pemerintah Republik Indonesia. Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air.
- Peter, R.E., and Yu, K.L. 1997. Neuroendocrine regulation of ovulation in fishes: basic and applied aspects. *Rev. Fish. Biol. Fisher*, 7: 173-197p.
- Prabowo R. 2005. Akumulasi kadmium pada daging ikan bandeng. *Jurnal Ilmu-ilmu Pertanian*, 1(2): 58-74 hal.
- Prabowo, R., Purwanto., Sunoko, H.R. 2012. Akumulasi Kadmium (Cd) pada Ikan Nilem sebagai Bioindikator Pencemaran Logam Berat di Kaligarang. *Mediagro*, 8(2): 1-7 hal.
- Prasetyo, A.D. 2009. *Penentuan Kandungan Logam (Hg, Pb dan Cd) dengan Penambahan Bahan Pengawet dan Waktu Perendaman yang Berbeda pada Kerang Hijau (Perna viridis L.) di Perairan Muara Kamal, Teluk Jakarta*. Skripsi. Universitas Islam Negeri Syarif Hidayatullah. Jakarta.
- Pratiwi, D.F. 2016. *Tingkat Pencemaran Logam Kadmium (Cd) dan Kobalt (Co) pada Sedimen di Sekitar Pesisir Bandar Lampung*. Skripsi. Fakultas Matematika dan Ilmu Pegetahuan Alam, Universitas Lampung.
- Prayogo, N.A., Siregar, A., Sukardi, P. 2016. The Disruptive Effect Mercurychloride (HgCl) on Gene Expression of cGnRH-II, sGnRH, and Estradiol Level in Silver Sharkminnow (*Osteochillus hasselti* C.V.). *Turkish Journal of Fisheries and Aquatic Sciences*, 16: 1003-1009p.
- Prayogo, N. A., Hidayati, A., Siregar, A. S., Yunasfi. 2016. Uji Toksisitas Letal dan Subletal Logam Berat Merkuri (Hg) Terhadap Ikan Nilem (*Osteochilus hasselti*). *Omni Akuatika*, 12 (1): 86–94 hal.
- Priya, P.L.N., Pillail, A., Gupta, S. 2004. Effect of simultaneous exposure to lead and cadmium on gonadotropin binding and steroidogenesis on granulosa cells : An *in vitro* study. *Indian Journal of Experimental Biology*, 42: 143–148p.
- Pundir, G. 2019. Protective Role of Spirulina Platensis on Haematological Profile of Cadmium Sulphate Exposed Teleost, *Clarias batrachus*. *World Journal of Pharmaceutical Research*, 8(6): 1131-1140p.
- Purnegoro, T. 2017. Faktor-Faktor yang mempengaruhi Toksisitas Bahan Pencemar terhadap Organisme Perairan. *Oseana*, 42(2): 12-22 hal.

- Putri, M.R.A., Sugianti, Y., Krismono. 2015. Beberapa Aspek Biologi Ikan Nilem (*Osteochillus vittatus*) di Danau Talaga, Sulawesi Tengah. *BAWAL*, 7(2): 111-120 hal.
- Radiopoetro., Suharno., Tanjung, S.D., Suntoro, S.H., Tanjung, H.S.D., Muljo, A. 1997. Zoologi. Erlangga. Jakarta.
- Rainboth, W.J. 1996. Fishes of the Cambodian Mekong. FAO Species Identification Field Guide for Fishery Purposes. FAO, Rome.
- Rismansyah, E., Budianta, D., Pambayun, R. 2015. Analisis Kandungan Timbal (Pb) dan Kadmium (Cd) dalam Pempek Rebus dari Beberapa Tempat Jajanan di Kota Palembang Sumatera Selatan. *Jurnal Penelitian Sains*, 17(2): 59-65 hal.
- Rumahlatu, D., Corebima, A.D., Amin, M., Rachman, F. 2012. Kadmium dan Efeknya terhadap Ekspresi Protein Metallothionein pada Deadema setosum (Echinoidea; Echinodermata). *Jurnal Penelitian Perikanan*, 1(1): 26-35 hal.
- Saanin. 1984. Taksonomi dan Kunci Identifikasi Ikan. Binacipta Bogor. Bogor.
- Said, N. I. 2010. Metoda Penghilangan Logam Berat (As, Cd, Cr, Ag, Cu, Pb, Ni dan Zn) didalam air Limbah Industri. *JAI*, 6(2): 136-148 hal.
- Saputra, S.W., Soedarsono, P., Sulistyawati, G.A. 2009. Beberapa Aspek Biologi Ikan Kuniran (*Upeneus spp*) di Perairan Demak. *Jurnal Saintek Perikanan*, 5(1): 1-6 hal.
- Schulz, R.W., Vischer, H.F., Cavaco, J.E., Santos, E.M., Tyler, C.R., Goos, H.J. 2001. Gonadotropins, their receptors, and the regulation of testicular functions in fish. *Comparative Biochemistry Physiology B*, 29: 407-417p.
- Shah, S.L., and Altindag, A. 2005. Effects of Heavy Metal Accumulation on the 96-h LC50, Values in Tench *Tinca tinca* L., 1758. *Turk J Vet Anim Sci*, 29: 139-144p.
- Sharma, H., Rawal, N., Mathew, B.B. 2015. The Characteristics, Toxicity and Effects of Cadmium. *International Journal of Nanotechnology and Nanoscience*, 3: 1-9 hal.
- Sherwood, N.M., and Coe, I.R. 1991. Neuropeptides and their genes in fish. In: A.P. Scott, J.P. Sumpter, D.E. Kime, ans M.S. Rolfe (eds.). Proseding of the fourth International Symposium on the Reproductive Pfysiology of Fish. Noewich, UK. Fish Symposium, Sheffield 38-40p.
- Siregar, A. S., and Prayogo, N.A. 2017. The disruptive effect of mercury chloride (HgCl) on gene expression of gonadotrophin hormones and testosterone level in male silver sharkminnow (*Osteochilus hasseltii* C.V.) (Teleostei: Cyprinidae). *The European Zoological Journal*, 84(1): 436-443p.
- Siregar, A.S., Prayogo, N.A., Harisam, T. 2019. The Accumulation of Heavy Metals Cadmium (Cd) in Water, Sediments and Aquaculture Biota which

- Contaminated by Batik Waste in Mulyorejo Village Pekalongan. *IOP Conference Series: Earth and Environmental Science*, 406: 1-10p.
- Siregar, A.S., Sulistyo, I., Prayogo, N.A. 2020. Heavy metal contamination in water, sediments and *Planiliza subviridis* tissue in the Donan River, Indonesia. *Journal of Water and Land Development*, 45(4-6):157-164p.
- Soegianto, A., Primarastri, N.A., Winarni, D. 2009. Pengaruh Pemberian Kadmium terhadap Tingkat Kelangsungan Hidup dan Kerusakan Struktur Insang dan Hepatopankreas pada Udang Regang (*Macrobrachium sintangense*). *Berk. Penel. Hayati*, 10: 59-66 hal.
- Status Lingkungan Hidup Daerah Kabupaten Banyumas. 2009. Pemerintah Kabupaten Banyumas. Provinsi Jawa Tengah.
- Sumantadinata K. 1983. Pengembangan Ikan-Ikan Peliharaan di Indonesia. Satra Hudaya. Jakarta.
- Sumpter, J.P., and Scott, A.P. 1989. Seasonal Variations in Plasma and Pituitary Levels of Gonadotropin in Males and Females of Two Strains of Rainbow Trout (*Salmo gairdneri*). *General and Comparative Endocrinology*, 75: 376-388p.
- Supriyaningrum, E. 2006. *Fluktuasi Logam Berat Timbal dan Kadmium dalam Air dan Sedimen di Perairan Teluk Jakarta (Tanjung Priuk, Marina, dan Sunda Kelapa)*. Skripsi. Fakultas ilmu Pengetahuan Alam, Institut Pertanian Bogor.
- Supriyantini, E., dan Endrawati, H. 2015. Kandungan Logam Berat Besi (Fe) pada Air, Sedimen, dan Kerang Hijau (*Perna viridis*) di Perairan Tanjung Emas Semarang. *Jurnal Kelautan Tropis*, Vol. 18(1):38-45 hal.
- Susanto, H. 2001. Budidaya Ikan di Pekarangan. Penebar Swadaya. Jakarta.
- Suwarsito, dan Sarjanti, E. 2014. Analisa Spasial Pencemaran Logam Berat pada Sedimen dan Biota Air di Muara Sungai Serayu Kabupaten Cilacap. *Geoedukasi*, 3(1): 30-37 hal.
- Suzuki, K., Nagahama, Y., Kawauchi, H. 1988. Steroidogenic activities of two distinct gonadotropins. *General and Comparative Endocrinology*, 71: 452-548p.
- Swanson, P., Suzuki, P., Kawauchi, H., Dickhoff, W.W. 1991. Isolation and characterization of two coho salmon gonadotropin, GTH-I and GTH-II. *Biology of Reproduction*, 44: 29-38p.
- Thermo Scientific. 2016. *DNase I, RNase-free : Removal of genomic DNA from RNA preparations*. Thermo Fisher Scientific Inc. California.
- Thomas, P. 1993. Effects of Cadmium on Gonadotropin Secretion from Atlantic Croaker Pituitaries Incubated in Vitro. *Marine Environmental Research*, 35: 141-145p.
- Widowati, W., Sastiono, A., Yusuf, R. 2008. Efek Toksik Logam, Pencegahan dan Penanggulangan Pencemaran. Andi Offset. Yogyakarta.

- Wijayanti, G.E., Soeminto., Simanjuntak, S.B.I. 2009. Profil Hormon Reproduksi dan Gametogenesis pada Gurame (*Oosphronemus gouramy* Lac) Betina. *Jurnal Akuakultur Indonesia*, 8(1): 77 - 89 hal.
- Willoughby, S. 1999. Manual of Salmonid Farming. Black Well Science. London.
- Yaron, Z. 1995. Endocrinology control of gametogenesis and spawning induction in the carp. *Aquaculture*, 129: 49-73p.
- Zahri, A., Agus, O. S., Muhammad, Z.J. 2018. Profil Hormon FSH, LH, dan estradiol serta kadar glukosa darah sidat, *Anguilla bicolor bicolor* (Mc Clelland, 1844) yang dirangsang hormone HCG, MT, E2 dan Anti Dopamin. *Jurnal Iktiologi Indonesia*, 18(1) : 57-67p.
- Zikic, R.V., Stajn, A.S., Pavlovic, S.Z., Ognjanovic, B.I., Saicic, Z.S. 2001. Activities of Superoxide Dismutase and Catalase in Erythrocytes and Plasma Transaminases of Goldfish (*Carassius auratus gibelio* Bloch.) Exposed to Cadmium. *Physiol. Res.* 50: 105-111p.

