



DAFTAR PUSTAKA

- Affandi, R. dan U.M. Tang. 2002. Fisiologi hewan air. Universitas Riau Press. Riau.
- Amrullah. 2005. Penggunaan immunostimulan Spirulina platensis untuk meningkatkan ketahanan tubuh ikan koi (*Cyprinus carpio*) terhadap virus herpes. Tesis, Program Pasca Sarjana Institute Pertanian Bogor, Bogor.
- Anderson, D. P. and Siwicki. 1994. Simplified assay for measuring nonspecific defence mechanism in fish. Fish Health section. American Fisheries Meeting. Seattle, Washington, 1-26.
- Anderson, D.P. and A.K. Siwicki. 1995. Basic haematology and serology for fish health programs. In: Diseases in Asian Aquaculture II. M. Syariff, J.R. Arthur and R.P. Subasinghe (Eds.). Fish Health Section. Asian Fisheries Society. Manila. Philippines :185-202.
- Appleton, J. 2002. Arginine: Clinical potential of a semi-essential amino acid. Alternative Medicine Review. 7:512-522.
- Apriyandi, R. 2008. Perbandingan hematologi ikan baung (*Mystus nemurus* CV) yang dipelihara dalam kolam dan keramba. Skripsi. Fakultas Perikanan dan Ilmu Kelautan. Universitas Riau.
- Arie, U. 1999. Pembenihan dan Pembesaran Nila Gift. Cet 1 Penebar Swadaya. Jakarta
- Awad, E. and A. Awaad. 2017. Role of Medicinal Plants on Growth Performance and Immune Status in Fish. Fish & shellfish immunology. 67: 40-54.
- Azka A., Nurjanah, & A. M. Jacoeb. 2015. Profile of Fatty Acids, Amino Acids, Carotenoid Total, and α -Tocopherol from Flying Fish Eggs. JPHPI, 18 (3).
- Bachtiar, Y. Subchan, T. Wahju, dan S. Nanik. 2012. Pengaruh ekstrak alga cokelat (*Sargassum* sp.) terhadap pertumbuhan bakteri *Escherichia coli*. Journal of Marine and Coastal Science, 1(1): 53 – 60.
- Baratawidjaja, K. G. 2006. Imunologi dasar, edisi VII. Balai Penerbit Fakultas Kedokteran Universitas Indonesia. Jakarta.
- Bittencourt, N. L. R., L. M. Molinary, D. O. Scoaris, R. B. Pedroao, C. V. Nakamura, B. A. A., Filho, and B. P. D. Filho. 2003. Haematological and biochemical values for nile tilapia *Oreochromis niloticus* cultured in semi-intensive system. Biological Sciences, 25:385-389.
- Bold H. C. and M. J. Wyne. 1985. Introduction to the Algae, Structure and Reproduction. Second Edition. Prntice-Hall. New Jersey.
- Bricknell, I., and R.A. Dalmo. 2005. The use immunostimulants in fish larval aquaculture. Fish and Shellfish Immunology. 19: 457-472.
- BSNI. 2009. SNI No.7550:2009 Produksi Ikan Nila (*Oreochromis niloticus Bleeker*) Kelas Pembesaran di Kolam Air Tenang. Badan Standardisasi Nasional, Jakarta.



Castro, R., I. Zarra, J. Lamas. 2003. Water-soluble Seaweed extract modulate the respiratory burst activity of turbot phagocytes. *Aquaculture*. 229:67-68.

Cavalier-Smith, T. and E.E. Chao. 2006. Phylogeny and megasystematics of phagotrophic heterokonts (Kingdom Chromista). *Journal of Molecular Evolution*. 62: 388–420.

Cipriano, R.P., G.L. Bullock, S.W. Pyle. 1984. *Aeromonas hydrophila* and Motile *Aeromonas* *septicemias* of Fish: Fish Disease Leaflet 68, Fish and Wildlife Service. West Virginia, US, p. 20-23.

Coston-Clements, L., L.R. Settle, D.E. Hoss, and F.A. Cross. 1991. Utilization of The Sargassum Habitat by Marine Invertebrates and Vertebrates. *A Review*: Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Beaufort Laboratory, US. 296.

Craig S. 2009. Understanding Fish Nutrition, Feeds, and Feeding. [internet]. [diunduh 10 Maret 2019]. Tersedia pada: https://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/420/420-256/420-256.pdf.pdf

Edison, T. 2009. Amino acid: Esensial for our bodies. <<http://livewellnaturally.com>>. Diakses tanggal 27 September 2019.

Elala NA, Marzouk M, Moustafa M. 2013. Use of different *Saccharomyces cerevisiae* biotic forms as immune-modulator and growth promoter for *Oreochromis niloticus* challenged with some fish pathogens. *International Journal of Veterinary Science and Medicine*. 1: 21-29.

Fujaya, Y. 2004. Fisiologi Ikan: Dasar Pengembangan Teknologi Perikanan. Penerbit Rineka Cipta, Jakarta.

Food and Agriculture Organization. 2013. FishStat Plus (Universal software for fishery statistical time series). FAO. Rome, Italy. 41P.

Galeotti, M. I 998. Some Aspects of the Application of Immunostimulants and A Critical Review of Methods for Their Evaluation. *J. Ichthyology*. 14: 89-199.

Gopalakannan, A., V. Arul. 2006. Immunomodulatory effects of dietary intake of chitin, chitosan and levamisole on the immune system of *Cyprinus carpio* and control of *Aeromonas hydrophila* infection in ponds. *Aquaculture*, 255: 179–187.

Habte-Tsion, H., X. Ge, B. Liu, J. Xie, M. Ren, Q. Zhou, L. Miao, L. Pan and R. Chen. 2015. A deficiency or an excess of dietary threonine level affects weight gain, enzyme activity, immune response and immune-related gene expression in juvenile blunt snout bream (*Megalobrama amblycephala*). *Fish and Shellfish Immunology* 42: 439–446.

Harabawy A. S. A., Ibrahim A.T.A. 2014. Sublethal toxicity of carbofuran pesticide on the African catfish *Clarias gariepinus* (Burchell, 1822): Hematological, biochemical and cytogenetic response. *Ecotoxicology and Environmental Safety*. 103: 61-67.

Harikrishnan, R., C. Balasundaram, and M.S. Heo. 2011. Impact of Plant Products on Innate and Adaptive Immune System of Cultured Finfish and Shellfish. *Aquaculture*. 317(1-4): 1-15.



Herberman, R. B., & Ortaldo, J. R. 1981. Natural killer cells: their role in defenses against disease. *Science*, 214(4516), 24-30.

Herlina, T. 2007. Gambaran darah pada ikan mas (*Cyprinus carpio L.*) yang terserang berbagai jenis golongan penyakit berdasarkan analisis hematologi darah dan diferensiasi leukosit. Stasiun Karantina Ikan Kelas II Bengkulu, 85 hlm.

Isnansetyo, A., A. Fikriyah, N. Kasanah, Murwantoko. 2015. Non-specific immune potentiating activity of fucoidan from a tropical brown algae (Phaeophyceae), *Sargassum cristaefolium* in tilapia (*Oreochromis niloticus*). *Aquaculture International Journal*

Isnansetyo, A., H. M. Irpani, T. A. Wulansari, N. Kasanah. 2014. Oral Administration of Alginate from A Tropical Brown Seaweed, *Sargassum* sp. to Enhance Non-Spesific Defense in Walking Catfish (*Clarias* sp.). *Aquaculta Indonesia*. 15(1):14-20.

Jain, N.C. 1993. Essentials of Veterinary Hematology. Lea and Febiger Publishing. Philadelphia. 417p.

Kiron, B., Watanabe, T B 1995. Prospects of larval fish dietetics. *Aquaculture* 124 : 223-251.

Kamińska, A. S., G. Matysik, M. W. Kosior, H. Donica, I. Sowa. 2009. Thin Layer Chromatography of Sugars in Plant Material, *Annales Universitatis Mariae Curie-Skłodowska*, 22 (4): 2.

Khairuman, & K. Amri. 2002. Budidaya lele lokal secara intensif. Agromedia Pustaka, Jakarta.

Kementrian Kelautan dan Perikanan. 2017. Laporan Tahunan Kementerian Kelautan dan Perikanan Tahun 2017 Menurut Komoditi. Jakarta (ID).

Kordi K. 2009. Budi Daya Perairan. PT. Citra Aditya Bakti. Bandung.

Kordi, K.M. Ghufran. 2013. Farm Big Book: Budidaya Ikan Konsumsi Air Tawar. Lily Publisher. Yogyakarta.

Kusmardi, S. K., dan Wulandari, D. 2006. Pengaruh pemberian ekstrak etanol daun johar (*cassia siamea lamk.*) terhadap peningkatan aktivitas dan kapasitas fagositosis sel makrofag. Makara seri Kesehatan UI, 10(2), 89-93.

Lee, K. Y., & Mooney, D. J. 2012. Alginate: properties and biomedical applications. *Progress in polymer science*, 37(1), 106-126.

Li, P., Y. Long, Yin, D. Li, S. W. Kim, and G. Wu. 2007. Amino acids and immune function. *Journal of Nutrition*, 98: 237 – 252.

Magnadottir, B. 2006. Innate immunity of fish (overview). *Fish Shellfish Immunol* 20: 137-151.

Martini, F. 2001. Fundamentals of Anatomy & Physiology, 5 th Ed. Prentice Hall, New Jersey.

Moyle, P.B., and J.J. Cech Jr. 1988. Fishes; An Introduction to Ichthyology. Prentice Hall, Inc. USA. p. 559.

Parsing, J., Gerung, G., Sondak, C., Wagey, B., Ompi, M., Kondoy, K. 2017. Morfologi *Sargassum* sp di kepulauan Raja Ampat, Papua Barat. *Jurnal Pesisir Dan Laut Tropis*, 1(1), 13-17.



- Pawar, S. N. and K. Edgar. 2012. Alginate Derivation: A Review of Chemistry, Properties, and Applications. *Biomaterials*. 33 (1): 3279 – 3305.
- Raa, J., G. Roerstad, R. Engstad and B. Robersten 1992. The Use of Immunostimulant to Increase Resistance of Aquatic Organism to Microbial Infection in M. Sharif, R.P. Subangsihe and J.R. Arthur (eds.). Diseases in Asian Aquaculture I. Fish Health Sect. Asian Fish. Soc. Manila p: 39-50.
- Resita, D., Merdekawati, W., Susanto, A. B., Limantara, L. 2010. Kandungan dan komposisi pigmen *Sargassum* sp. pada perairan Teluk Awur, Jepara dengan perlakuan segar dan kering. *Journal of Fisheries Sciences*, 12(1), 11-19.
- Ringo, E, R.E. Olsen, J. L. G. Vecino, S. Wadsworth and S.K. Song. 2012. Use of Immunostimulants and Nucleotides in Aquaculture: A Review. *J Mar Sci Res Dev*, 1, 104.
- Saanin, H. 1984. *Taksonomi dan Kuntji Identifikasi Ikan*. Binatjipta, Bogor.
- Sakai, M. 1999. Current research status of fish immunostimulants. *Aquaculture*. 172: 63– 92.
- Salasia, S.I.O. (1998). Sifat Adhesive dan fagositosis *Steptococcus equi Sub Sp Zooepidemicus* Isolat Indonesia. *Jurnal sains Veteriner*. 16:42-50pp.
- Salasia, S.I.O., D. Sulanjari, dan A. Ratnawati. 2001. Studi Hematologi Ikan Air Tawar. *Jurnal Biologi*. 2:710-723.
- Saputra, E. A. 2008. Kondisi darah ikan bawal air tawar (*Collossoma macropomum*) yang dipelihara di kolam budidaya. Skripsi. Fakultas Perikanan dan Ilmu Kelautan. Universitas Riau.
- Sarathi, M., I. Ahmed, C. Venkatesan, G. Balasubramaniyan, J. Prebavathy, and A. S. S. Hameed. 2007. Comparative study on immune response of *Fenneropenaeus indicus* to *Vibrio alginolyticus* and white spot syndrome virus. *Aquaculture*. 271:8-20.
- Sari-Chmayssem, N., S. Taha, H. Mawlawi, J. P. Guégan., J. Jeftić, and T. Benvegnu. 2016. Extracted and Depolymerized Alginates From Brown Algae *Sargassum vulgare* of Lebanese Origin: Chemical, Rheological, and Antioxidant Properties. *Journal of Applied Phycology*. 28(3):1915-1929.
- Silberfeld, T., F. Rousseau & B. de Reviers. 2014. An Updated Classification of Brown Algae (Ochrophyta, Phaeophyceae). *Cryptogamie Algologie*. 35(2):117-156.
- Soetomo HAM. 1988. *Teknik Budidaya Udang Windu*. Sinar Baru Bandung. Bandung.
- Spector, W.G. 1993. An introduction to general pathology. Third Edition. Churcill Livingstone, London.
- Stewart, M. B., Myat, D. T., Kuiper, M., Manning, R. J., Gray, S. R., Orbell, J. D. 2017. A structural basis for the amphiphilic character of alginates–Implications for membrane fouling. *Carbohydrate Polymers*, 164, 162-169.
- Sugiani D. 2012. Vaksin Bivalen untuk Pencegahan Penyakit Motile Aeromonas Septicemia dan Streptococcosis pada Ikan Nila (*Oreochromis niloticus*) [Disertasi]. Bogor: Sekolah Pascasarjana Institut Pertanian Bogor.



- Suhermanto A, Andayani S, Maftuch. 2011. Pemberian Total Fenol Teripang Pasir (*Holothuria Scabra*) untuk Meningkatkan Leukosit dan Diferensial Leukosit Ikan Mas (*Cyprinus carpio*) yang Diinfeksi Bakteri *Aeromonas Hydrophila*. Jurnal Kelautan 4 (2).
- Suksamrarn, S., Suwannapoch, N., Phakhodee, W., Thanuhiranlert, J., Ratananukul, P., Chimnoi, N., and Suksamrarn, A. (2003). Antimycobacterial Activity of Prenylated Xanthones from the Fruit of *Garcinia mangostana*, Chem. Pharm. Bull, 51 (7), 857-859 (Gentianaceae), Drukkerij Elinkwijk bv, Utrecht, pp 109 –114.
- Syahailatua, D. Y. 2009. Seleksi bakteri probiotik sebagai stimulator sistem imun pada udang vaname *Litopenaeus vannamei*.
- Tizard, I. 1988. An introduction to veterinary immunology. Second Ed. WB. Saunders Company, Philadelphia.
- Uribe, C. H. Folch., R. Enriquez, and G. Moran. 2011. Innate and adaptive immunity in teleost fish: a review. Veterinarni Medicina Journal, Vol. 56.
- Wahab, A. Samik dan Mardina Julia. 2002. Sistem Imun, Imunisasi, dan Penyakit Imun. Widiya Medika, Jakarta
- Waryono, T. 2001. Biogeografi Alga Makro (Rumput) Laut di Kawasan Pesisir Indonesia. Kumpulan Makalah Periode 1987-2008. 1-6.
- Watanuki, H., G. Chakraborty, H. Korenaga, T. Kono, R.B. Shivappa, and M. Sakai. 2009. Immunostimulatory Effects of Natural Human Interferon-alpha (huIFN- α) on carps *Cyprinus carpio* L. Vet Immunol Immunopathol. 131:273–277
- Wijendra, G.D.N.P. and A. Pathiratne. 2007. Evaluation of immune responses in an indian carp, *Labeo rohita* (Hamilton) fed with levamisole incorporated diet. J. Sci. Univ. Kelaniya, 3: 17-28.
- Wilson, R. P., & Halver, J. E. (1986). Protein and amino acid requirements of fishes. Annu. Rev. Nutr. 6, 225-244. <http://dx.doi.org/10.1146/annurev.nu.06.070186.001301>
- Wulansari. (2009). Pengaruh Ekstrak Air dan Ethanol *Alpinia* spp terhadap aktifitas dan Kapasitas Fagositosis Sel Macrophage yang Diinduksi dari Bakteri *Stapilococcus Epidermidis* Secara In Vitro. Pusat Penelitian Biologi LIPI. Bogor.
- Yaqoob, P., Newsholme, E. A., & Calder, P. C. 1994. Inhibition of Natural Killer Cell Activity by Dietary Lipids. Immunology letters, 41(2-3), 241-247.
- Yeh S.P., C.A. Chang, C.Y. Chang, C.H. Liu, and W. Cheng. 2008. Dietary Sodium Alginate Administration Affects Fingerling Growth and Resistance to *Streptococcus* sp. and Iridovirus, and Juvenile Non-Specific Immune Responses of The Orange-Spotted Grouper (*Epinephelus coioides*). Fish & Shellfish Immunology. 25(1): 19-27.
- Yudiat, E., A. Isnansetyo, Murwantoko, Ayuningtyas, Triyanto, dan C. R. Handayani. 2016. Innate immune stimulating and immune genes up-regulating activities of three types of alginate from *Sargassum siliquosum* in Pacific white shrimp, *Litopenaeus vannamei*. Fish & Shellfish Immunology. 54:46-53.