

DAFTAR PUSTAKA

- Adel, M., Yeganeh, S., Dawood, M. A. O., Safari, R., and Radhakrishnan, S. 2017. Effects of *Pediococcus pentosaceus* supplementation on growth performance, intestinal microflora and disease resistance of white shrimp, *Litopenaeus vannamei*. *Aquaculture Nutrition*. 23(6): 1401–1409. <https://onlinelibrary.wiley.com/doi/10.1111/anu.12515>.
- Afonso, V., Champy, R., Mitrovic, D., Collin, P., and Lomri, A. 2007. Reactive oxygen species and superoxide dismutases: Role in joint diseases. *Jt. Bone, Spine*. 74(4): 324-329.
- Agudo, N. 2006. Sandfish hatchery techniques. Australian Centre for International Agricultural Research, Secretariat of the Pacific Community and the WorldFish Center, Noumea. 44 pp.
- Agudo, N. 2012. Pond grow-out trials for sandfish (*Holothuria scabra*) in New Caledonia. In: Hair, C., Pickering, T., Mills, D. (Eds.), Asia-Pacific Tropical Sea Cucumber Aquaculture. *Proceedings of an International Symposium held in Noumea, New Caledonia, 15–17 February, 2011*. Australian Centre for International Agricultural Research, Canberra. pp. 104–112.
- Altamirano, J. P., and Noran-Baylon, R. D. 2020. Nursery culture of sandfish *Holothuria scabra* in sea-based floating hapa nets: Effects of initial stocking density, size grading and net replacement frequency. *Aquaculture* (Amsterdam, Netherlands) 526. <https://www.elsevier.com/doi/10.1016/j.aquaculture.2020.735379>.
- Altamirano, J.P., Recente, C.P., and Rodriguez Jr., J.C. 2017. Substrate preference for burying and feeding of sandfish *Holothuria scabra* juveniles. *Fish. Res.* 186: 514-523. <https://www.sciencedirect.com/doi/10.1016/j.fishres.2016.08.011>.
- AOAC, 1990. Official methods of analysis. 12th ed. Washington, D.C. Association of Official Analytical Chemists, 1141 p.
- Asniatih, Idris, M., dan Sabilu, K. 2013. Studi histopatologi pada ikan lele dumbu (*Clarias gariepinus*) yang terinfeksi bakteri *Aeromonas hydrophila*. *Jurnal Mina Laut Indonesia*. 3(12): 13-21.
- Ardiansyah, A., Bayu, A., Wulandari, D.A., and Putra, M.Y. 2022. Fatty acid from sea cucumber: mini review. *AIP Conference Proceeding* 2563.050021. <https://www.pubs.aip.org/doi/10.1063/5.0103471>.
- Arya, M., Shergill, I., Williamson, M., Gommersall, L., Arya, N., and Patel, H. 2005. Basic principles of the real time quantitative PCR. *Expert Review of Molecular Diagnostics*. 5(2): 209-219. <https://www.tandfonline.com/doi/10.1586/14737159.5.2.209>.

- Axler, R., Larsen, C., Tikkanen, C., McDonald, M., Yokom, S., and Aas, P. 1996. Water quality issues associated with aquaculture: A case study in mine pit lakes. *Water Environment Research*. 68(6): 995-1011. <https://www.experts.umn.edu/doi/10.2175/106143096X128027>.
- Aziz, A. 1996. Makanan dan cara makan berbagai jenis teripang. *Oseana*. XXI (4): 43-59.
- Balcazar, J.L., De Blas, I., Ruiz-Zarzuela, I., Cunningham, D., Vendrell, D., and Muzquiz, J.L. 2006. The role of probiotics in aquaculture. *Veterinary Microbiology*. 114(3-4): 173-86.
- Balcázar, J. L., & Rojas-Luna, T. 2007. Inhibitory activity of probiotic *Bacillus subtilis* UTM 126 against *Vibrio* species confers protection against Vibriosis in juvenile shrimp (*Litopenaeus vannamei*). *Current Microbiology*. 55(5): 409-412.
- Bai, Y., Zhang, L., Xia, S., Liu, S., Ru, X., Zhang, T., and Yang, H. 2016. Effects of dietary protein levels on the growth, energy budget, and physiological and immunological performance of green, white and purple color morphs of sea cucumber, *Apostichopus japonicus*. *Aquaculture*. 450: 375-382.
- Bairage, A., Ghosh, K.S., Send, S.K., and Ray, A.K. 2002. Enzyme producing bacterial flora isolated from fish digestive tracts. *Aquaculture International*. 10: 109-121.
- Bakus, G.J. 1973. The biology and ecology of tropical holothurians. Academic Press, New York. Vol. 2: 325-367.
- Barnes, R.D. 1991. Invertebrate Zoology. 6th ed. *Sounders College Publishing, USA*. p. 966-975.
- Battaglione, S.C., Seymour, J.E., and Ramofafia, C. 1999. Survival and growth of cultured juvenile sea cucumbers, *Holothuria scabra*. *Aquaculture*. 178: 293-322.
- Beltran-Gutierrez, M., Ferse, S.C.A., Kunzmann, A., Stead, S.M., Msuya, F.E., Hoffmeister, T.S., and Slater, M.J., 2016. Co-culture of sea cucumber *Holothuria scabra* and red seaweed *Kappaphycus striatum*. *Aquac. Res.* 47: 1549-1559. <https://www.semanticscholar.org/paper/doi/10.1111/are.12615>.
- Bergmeyer, H. U., and Grassi, M. 1983. *Methods of Enzymatic Analysis. Volume II*. Weinheim: Verlag Chemie. 539 pp.
- Borgeson, T.L., Racz, V.J., Wilkie, D.C., White, L.J., and Drew, M.D. 2006. Effect of replacing fish meal and oil with simple or complex mixtures of vegetable ingredients in diets fed to Nile tilapia, *Oreochromis niloticus*. *Aquacult. Nutr.* 12: 141-149.
- Borlongan, T. G. 1990. Studies on lipases of milkfish (*Chanos chanos*). *Aquaculture*, 89, 315-325. [https://www.sciencedirect.com/doi/10.1016/0044-8486\(90\)90135-A](https://www.sciencedirect.com/doi/10.1016/0044-8486(90)90135-A).

- Bottcher, M. F., Nordin, E. K., Sandin, A., Midtvedt, T., and Bjorksten, B. 2000. Microflora-associated characteristics in faeces from allergic and nonallergic infants. *Clinical & Experimental Allergy*. 30(11): 1591-1596.
- Boulard, C., Massin, C., and Jangoux, M. 1982. The fine structure of the bucal tentacles of *Holothuria forskali* (Echinodermata, Holothuroidea). *Zoomorpholog*. 101:133-149.
- Bradford, M.M. 1976. A Rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Anal Biochem*. 72: 284-254.
- Brett, J.R., and Groves, T.D.R. 1979. Physiological energetic. *In: Bioenergetics and growth*. (Eds.) Hoar, W.S., Randal, D.J., and Brett, J.R. *New York Academic Press*. 8: 279-352.
- Broom, M., Gabr, M. H., Al-Harbi, M., and Satheesh, S. 2021. Effect of feeding regime and stocking density on the growth performance of sea cucumber *Holothuria scabra*. *Egyptian Journal of Aquatic Biology and Fisheries*. 25(3): 635-646.
- Bureau, D.P., Hua, K., and Harris, A.M., 2008. The effect of dietary lipid and long-chain n-3 PUFA levels on growth, energy utilization, carcass quality, and immune function of rainbow trout *Oncorhynchus mykiss*. *J. World Aquacult. Soc*. 39 (1): 1-21.
- Burtin, P. 2003. Nutritional Value of Seaweeds. *Electronic Journal of Environmental, Agricultural and Food Chemistry*. 2: 498-503.
- Calow, P. 1984. Economics of Ontogeny – adaptional Aspect. *Evolutionary Ecology*. 34: 123-134.
- Calow, P., and Townseed, C.R. 1981. Energetic, Ecology and Evolution. *J. of Physiol. Ecol*. 45: 39 – 53.
- Callewaert, L., and Michiels, C. 2010. Lysozymes in the animal kingdom, *J. Biosci*. 35: 127-160.
- Cannon, L.R.G., and Silver, H. 1987. Sea cucumber of northern Australia, Queensland Cultural Center South Brisbane Australia. 60 pp.
- Caruso, G., Denaro, M.G., and Genovese, L. 2009. Digestive enzymes in some teleost species of interest for mediterranean aquaculture. *The Open Fish Science Journal*. 2(1):74-86.
- Castell, J.D., Kennedy, E.J., Robinson, S.M.C., Parsons, G.J., Blair, T.J., and Gonzalez-Duran, E. 2004. Effect of dietary lipids on fatty acid composition and metabolism in juvenile green sea urchins (*Strongylocentrotus droebachiensis*). *Aquaculture*. 242: 417-435.
- Ceccarelli, D.M., Logan, M., and Purcell, S.W. 2018. Analysis of optimal habitat for captive release of the sea cucumber *Holothuria scabra*. *Mar. Ecol. Prog. Ser*. 588: 85-100.
- Chi, C., Liu, J. Y., Fei, S. Z., Zhang, C., Chang, Y. Q., Liu, X. L., and Wang, G. X. 2014. Effect of intestinal autochthonous probiotics isolated from the

- gut of sea cucumber (*Apostichopus japonicus*) on immune response and growth of *A. japonicus*. *Fish and Shellfish Immunology*. 38: 367-373.
- Chia, F. and Xing, J. 1996. Echinoderm coelomocytes, *Zool. Stud.* 35 (4): 231-254.
- Chiaramonte, M., and Russo, R. 2015. The echinoderm innate humoral immune response. *Italian Journal of Zoology*. 82(3): 300-308. <https://www.tandfonline.com/doi/10.1080/11250003.2015.1061615>.
- Cook, J.T., McNiven, M.A., Richardson, G.F., and Sutterlin, A.M. 2000. Growth rate, body composition and feed digestibility/conversion of growth-enhanced transgenic Atlantic salmon (*Salmo salar*). *Aquaculture*. 188:15-32.
- Conand, C. 1991. Long-term movements and mortality of some tropical sea-cucumbers monitored by tagging and recapture. In: Yanagisawa, T., Yasumasu, I., Oguro, C., Suzuki, N., Motokawa, T. (eds) *Biology of Echinodermata*. CRC Press, Netherlands. p. 169-175.
- Conand, C., Polidoro, B.A., Mercier, A., Gamboa, R.U., Hamel, J.F., and Purcell, S.W. 2014. The IUCN Red List assessment of aspidochirotid sea cucumbers and its implications. *SPC Beche-de-mer Information Bulletin*. 34: 3-7.
- Cui, L.B., Dong, Z.N., and Lu, Y.H. 2000. Histological and histochemical studies on the digestive system of *Apostichopus japonicus*. *Chin. J. Zoo.* 35: 2-4.
- Darman, Idris, M., dan Astuti, O. 2017. Pertumbuhan dan kelangsungan hidup teripang pasir (*Holothuria scabra*) yang dibudidayakan pada karamba jaring tancap. *Media akuatika*. 2(3): 60-69. <https://www.ojs.uho.ac.id/index.php/JMA/doi/10.33772/jmav2i3.4340>.
- Deganp, G., and Yehuda, Y. 1999. Digestibility of protein sources in feed for *Oreochromis aureus* x *O. nilotica*. *Indian J. Fish.* 46: 33-39.
- Delroisse, J., Wayneberghe, K.V., Flammang, P., Gillan, D., Gerbaux, P., Opina, N., Todinanahary, G.G.B., and Eeckhaut, I. 2020. Epidemiology of a Skin Ulceration Disease (SKUD) in the sea cucumber *Holothuria scabra* with a review on the SKUD in Holothuroidea (Echinodermata). *Scientific Reports*. 10, 22150. <https://www.nature.com/doi/10.1038/s41598-020-78876-0>.
- Deng, H., He, C. B., Zhou, Z. C., Liu, C., Tan, K. F., Wang, N. B., Jang, B., Gao, X. G., and Liu, W. D., 2009. Isolation and pathogenicity of pathogens from skin ulceration disease and viscera ejection syndrome of the sea cucumber *Apostichopus japonicus*. *Aquaculture*. 287: 18-27.
- De Silva, S.S., and Anderson, T.A. 1995. Fish nutrition in aquaculture. *Chapman & Hall*. UK. 319 pp.
- Dharma, L. dan N. Suhenda. 1986. Pengaruh pemberian pakan dengan tangan dan alat self feeder terhadap pertumbuhan dan produksi ikan mas di kolam air deras. *Bulletin Penelitian Perikanan Darat*. 5 (1): 79- 84.

- Dimitroglou, A., Merrifield, D.L., Spring, P., Sweetman, J., Moate, R., and Davies, S.J. 2010. Effects of *mannan oligosaccharide* (MOS) supplementation on growth performance, feed utilization, intestinal histology and gut microbiota of gilthead sea bream (*Sparus aurata*). *Aquaculture*. 300:182-188.
- Dobson, G. T., Duy, N. D. Q., and Southgate, P. C. 2020. First assessment of the potential for coculture of sandfish (*Holothuria scabra*) with Babylon snail (*Babylonia areolata*) in Vietnam. *Journal of the World Aquaculture Society*. 51(2): 527-541. <https://www.onlinelibrary.wiley.com/doi/10.1111/jwas.12676>.
- Dolmatov, I.Y., and Ginanova, T.T. 2009. Post-autotomy regeneration of respiratory trees in the holothurian *Apostichopus japonicus* (Holothuroidea, Aspidochirota). *Cell and Tissue Research*. 336: 41-58.
- Dominguez, H., and Loret, E.P. 2019. Review: *Ulva lactuca*, asource of troubles and potential riches. *Mar. Drugs*, 17(6): 357. <https://www.mdpi.com/doi/10.3390/md17060357>.
- Dong, Y., Dong, S., Tian, X., Wang, F., and Zhang, M. 2006. Effects of diel temperature fluctuations on growth, oxygen consumption and proximate body composition in the sea cucumber *Apostichopus japonicus* Selenka. *Aquaculture*. 255(1-4): 514-521.
- Duy, N.D. 2012. Large-scale sandfish production from pond culture in Vietnam. In: Hair, C., Pickering, T., Mills, D. (Eds.), *Asia-Pacific Tropical Sea Cucumber Aquaculture. Proceedings of an International Symposium held in Noumea, New Caledonia, 15–17 February, 2011. Australian Centre for International Agricultural Research, Canberra*. pp. 34-39.
- Effendie, I. 1997. Biologi Perikanan. Yayasan Pustaka Nusantara. Yogyakarta.
- Ebert, T. 1996. Adaptive aspects of phenotypic plasticity in echinoderms. *Oceanol. Acta*. 19: 347-355.
- Eliseikina, M.G., and Margalamov, T.Y. 2002. Coelomocyte morphology in the *Holothurians Apostichopus japonicus* (Aspidochirota: Stichopodidae) and *Cucumaria japonica* (Dendrochirota: Cucumariidae). *Russian Journal of Marine Biology*. 28(3): 197-202.
- FAO. 2007. FAO Technical meeting on prebiotics. <https://www.fao.org/ag/agn/agns/index-stm>.
- Feral, J.F., and Massin, C. 1982. Digestive systems: Holothuroidea. In *Echinoderm Nutrition* (Eds. Jangoux, M., and Lawrence, J.M.) p. 191-212. AA Balkema, Rotterdam.
- Ferguson, J. C. 1969. Feeding, digestion and nutrition in Echinodermata. In M. Flokin., & B. T. Scheers, *Chemical ecology* (Vol. 3) (p. 71-100). New York: Academic Press.
- Firdaus, M., and Indriana, L.F. 2019. Nursery performance of sandfish *Holothuria scabra* juveniles in tidal earthen pond using different types of cage. *The 2nd International Symposium on Marine Science and Fisheries*. 1-7 pp.

- Fish, J. D. 1967. The digestive system of the holothurian, *Cucumaria elongata*. I. Structure of the gut and haemal system. *Biology Bulletin of the Russian Academy of Sciences*, 132: 337-353. <https://www.onlinelibrary.wiley.com/doi/10.2307/1539639>.
- Fjellheim, A.J., Playfoot, K.J., Skjermo, J., and Vadstein, O. 2007. Vibrionaceae dominates the microflora antagonistic towards *Listonella anguillarum* in the intestine of cultured Atlantic cod (*Gadus morhua* L.) larvae. *Aquaculture*. 269: 98-106.
- Forchielli, M.L., and Walker, W.A. 2005. The role of gut-associated lymphoid tissues and mucosal defence. *British Journal of Nutrition*. 93(S1): S41-S48.
- Fuller, R. 1992. Histology and Development of Probiotic. In Fuller (Editor): Probiotic the Scientific Basic. *Chapman and Hall*. p 1-8.
- Furuita, H. K. Konishi, K., and Takeuchi, T. 1999. Effect of different levels of eicosapentaenoic acid and docosahexaenoic acid in *Artemia* nauplii on growth, survival and salinity tolerance of larvae of the Japanese flounder, *Paralichthys olivaceus*. *Aquaculture*. 170: 59-69.
- Gao, F., Yang, H., Xu, Q., Wang, F., Liu, G., and German, D.P. 2008. Phenotypic plasticity of gut structure and function during periods of inactivity in *Apostichopus japonicus*. *Comp. Biochem. & Physiol. B*.150: 255-262. <https://www.german.bio.uci.edu/org/10.1016/j.cbpb.2008.03.011>.
- Gao, F., Yang, H., Xu, Q., Wang, F., and Liu, G. 2009. Effect of water temperature on digestive enzyme activity and gut mass in sea cucumber *Apostichopus japonicus* (Selenka), with special reference to aestivation. *China J. Oceanol. Limnol.* 27:714-22.
- Gao, F., Li, F.H., Tan, J., Yan, J.P., and Sun, H.L. 2014. Bacterial community composition in the gut content and ambient sediment of sea cucumber *Apostichopus japonicus* revealed by 16S rRNA gene pyrosequencing. *PLoS One*. 9(6):e100092. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.1371/journal.pone.0100092> PMID: 24967593.
- Garcia-Esquivel, Z., and Felbeck, H. 2006. Activity of digestive enzymes along the gut of juvenile red abalone, *Haliotis rufescens*, fed natural and balanced diets. *Aquaculture*, 261(2): 615-625.
- Giraspy, D.A.B., and Ivy, G. 2008. The influence of commercial diets on growth and survival in the commercially important sea cucumber *Holothuria scabra* var. *versicolor* (Conand, 1986) (Echinodermata: Holothuroidea). *SPC Beche de Mer Information Bulletin*. 28:46-52.
- Giri, N.A, Sembiring, S.B.M., Wibawa, G.S. dan Haryanti. 2019. Pertumbuhan teripang pasir (*Holothuria scabra*) yang dipelihara dalam bak karamba jaring apung di tambak dengan aplikasi beberapa formulasi pakan buatan. *Media Akuakultur*. 14(1):19-29.

- Gorospe, J. C., Juinio-Menez, M. A., and Southgate, P. C. 2019. Effects of shading on periphyton characteristics and performance of sandfish, *Holothuria scabra* Jaeger 1833, juveniles. *Aquaculture (Amsterdam, Netherlands)*, 512. <https://www.elsevier.com/doi/10.1016/j.aquaculture.2019.734307>.
- Gross, P.S., Al-Sharif, W.Z., Clow, L.A., and Smith, L.C. 1999. Echinoderm immunity and the evolution of the complement system. *Dev. Comp. Immunol.* 23: 429-442.
- Guderley, H., and Portner, H.O. 2014. Metabolic power budgeting and adaptive strategies in zoology: examples from scallops and fish. *Canadian Journal of Zoology*. 88: 753-763.
- Guillaume, J., and Choubert, G. 1999. Digestive physiology and nutrient digestibility in fishes. In: Nutrition and feeding of fish and crustaceans. Guillaume J, Kaushik S, Bergot P, Metaille R (editors) Springer-Praxis. pp. 27-56.
- Haetami, K. 2012. Konsumsi dan efisiensi pakan dari ikan jambal siam yang diberi pakan dengan tingkat energi protein berbeda. *Jurnal Akuatika*. 3 (2): 146-158.
- Hair, C. 2012. Sandfish (*Holothuria scabra*) production and sea ranching trial in Fiji. In Asia-Pacific tropical sea cucumber aquaculture. *ACIAR Proceedings, Australian Center for International Agricultural Research*. 136: 129-141.
- Hair, C., Mills, D. J., McIntyre, R., and Southgate, P. C. 2016. Optimising methods for community-based sea cucumber ranching: Experimental releases of cultured juvenile *Holothuria scabra* into seagrass meadows in Papua New Guinea. *Aquaculture Reports*. 3: 198-208. <https://www.cabdirect.org/doi/10.1016/j.aqrep.2016.03.004>.
- Hamel, J. F., Conand, C., Pawson, D. L., and Mercier, A. 2001. The sea cucumber *Holothuria scabra* (Holothuroidea: Echinodermata). Its biology and exploitation as Beche-de-Mer. *Advances in Marine Biology*. 41: 129-223. [https://www.semanticscholar.org/doi/10.1016/S0065-2881\(01\)41003-0](https://www.semanticscholar.org/doi/10.1016/S0065-2881(01)41003-0).
- Hamel, J.F., Mercier, A., Conand, C., Purcell, S., Toral-Granda, T.G., and Gamboa, R. 2013. *Holothuria scabra*. *The IUCN Red List of Threatened Species 2013*: e.T180257A1606648. <https://www.researchgate.net/doi/10.2305/IUCN.UK.2013-1.RLTS.T180257A1606648.en>.
- Handajani, H., dan Widodo, W. 2010. Nutrisi Ikan. *UMM Press. Malang*. 259 Hal.
- Hardy, R.W., 2010. Utilization of plant proteins in fish diets: effects of global demand and supplies of fishmeal. *Aquac. Res.* 41: 770-776.
- Hartati, R., Widianingsih, and Djunaedi, A. 2016. Ultrastruktur alimentary canal teripang *Holothuria scabra* dan *Holothuria atra* (Echinodermata: Holothuroidea). *Buletin Oseanografi Marina*. 5(1):86-96.

- Hashim, R., and Saat, M.A.M. 1992. The utilization of seaweed meals as binding agents in pelleted feeds for snakehead (*Channa striatus*) fry and their effects on growth. *Aquaculture*. 108: 299-308.
- Hermes-Lima, M., Storey, J.M., and Storey, K.B. 1998. Antioxidant defenses and metabolic depression. The hypothesis of preparation for oxidative stress in land snails. *Comp.Biochem. Physiol. B*. 120: 437-448.
- Hu, M., Li, Q., and Li, L. 2010. Effect of salinity and temperature on salinity tolerance of the sea cucumber *Apostichopus japonicus*. *Fish. Sci.* 76: 267-273.
- Huang, K., Wang, W., and Lu, J. 2003. Dietary protein requirement of juvenile *Penaeus vannamei*. *Journal of Fishery Sciences of China*. 10: 318-324.
- Huet, M. 1970. Textbook of fish culture breeding and cultivation of fish. *Fishing News (Book Ltd)*. London. 436 pp.
- Hudson, I.R., Wigham, B.D., and Tyler, P.A. 2005. The feeding behaviour of a deep-sea holothurian, *Stichopus tremulus* (Gunnerus) based on in situ observations and experiments using a Remotely Operated Vehicle. *J. Exp. Mar. Biol. Ecol.* 301: 75-91.
- Huiling, S., Mengqing, L., Jingping, Y., and Bijuan, C. 2004. Nutrien requirements and growth of the sea cucumber, *Apostichopus japonicus*. *Advances in sea cucumber aquaculture and management*. Lovatelli, A., Conand, A., Purcell, C., Uthicke, S., Hamel, S., and Mercier, J.F. (Eds.). *FAO Fisheries Technical Paper FAO, Rome, Italy*. 463: 327-331.
- Huisman, E. A. 1987. Principles of Fish Production. Depart, of Fish Culture on Fisheries. *Wageningen Agriculture University. Wageningen, Netherland*. p. 57-122.
- Huo, D., Sun, L., Ru, X., Zhang, L., Lin, C., Liu, S., Xin, X., and Yang, H. 2018. Impact of hypoxia stress on the physiological responses of sea cucumber *Apostichopus japonicus*: respiration, digestion, immunity and oxidative damage. 24 pp. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.7717/peerj.4651>.
- Hyman L. 1955. The invertebrates (IV): Echinodermata the coelomata bilateria. *New York: Mc Graw-Hill Co.* p. 156-162.
- Ighodaro, O.M., and Akinloyeb, O.A. 2018. First line defence antioxidants-superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX): their fundamental role in the entire antioxidant defence grid. *Alexandria Journal of Medicine*. 54: 287-293. <https://www.sciencedirect.com/doi/10.1016/j.ajme.2017.09.001>.
- Ighweela, K.A., Aziz bin Ahmad, and Abol-Munafi, A.B. 2013. Water stability and nutrient leaching of different levels of maltose formulated fish pellets. *Global Veterinaria*. 10 (6): 638-642.

- Indriana, L. F., Firdaus, M., Supono, and Munandar, H. 2017. Survival rate and growth of juvenile sandfish (*Holothuria scabra*) In various rearing conditions. *Marine Research in Indonesia*. 42(1): 11-18. <https://www.mri.lipi.go.id/doi/10.14203/mri.v41i2.156>.
- James, D. B. 1996. Culture of sea cucumber. *Bulletin of the Central Marine Fisheries Research Institute*. 48: 120-126.
- James, D.B., Gandhi, A.D., Palaniswamy, N., and Rodrigo, J.X. 1994. Hatchery techniques and culture of the sea-cucumber *Holothuria scabra*. *Bulletin of the Central Marine Fisheries Research Institute*. 57:1-47.
- Jangoux, M., and Lawrence, J. M., 1982. Echinoderm nutrition. *Rotterdam, The Netherlands: A.A. Balkema*.
- Ji, T.T., Dong, Y.W., and Dong, S.L. 2008. Growth and physiological responses in the sea cucumber, *Apostichopus japonicus* Selenka: aestivation and temperature. *Aquaculture*. 283:180-187.
- Jones, I. D. 1975. Effect of processing by fermentation of nutrients. In Harris, R. S., and Karmas, E. editors. Nutritional evaluation of food processing, Volume 324. *Avi Publishing Co. Inc, Westport, Connecticut, USA*.
- Juinio-Menez, M.A., Evangelio, J.C., and Miralao, S.J.A. 2014. Trial of the grow-out culture of sea cucumber *Holothuria scabra* in sea cages and pens. *Aquac. Res*. 45(8):1332-1340.
- Junus, S., Kwong, P.J., and Khoo, G., 2018. A review on the recent advances in the biology and aquaculture technology of *Holothuria scabra*. *Journal of Survey in Fisheries Sciences* 4(2), 5-25. <https://www.academia.edu/doi/10.18331/SFS2018.4.2.2>.
- Kang, K.H., Kwon, J.Y., and Kim, Y.M. 2003. A beneficial coculture: charm abalone *Haliotis discus hannai* and sea cucumber *Stichopus japonicus*. *Aquaculture*. 216 (1-4): 87-93.
- Kardana, D., Haetami, K dan Subhan, U. 2012. Efektivitas penambahan tepung maggot dalam pakan komersil terhadap pertumbuhan benih ikan bawal air tawar (*Colossoma macropomum*). *Jurnal Perikanan dan Kelautan*. 3(4): 177-184.
- Kelly, J.R., and Scheibling, R.E. 2012. Fatty acids as dietary tracers in benthic food webs. *Mar. Ecol. Prog. Ser.* 446: 1-22.
- Khanjani, M.H., Sharifinia, M., and Ghaedi, G. 2022. β -glucan as a promising food additive and immunostimulant in aquaculture industry-a review. *Ann. Anim. Sci.* 22(3): 817-827. <https://www.sciendo.com/doi/10.2478/aoas-2021-0083>.
- Kunhold, H., Kamyab, E., Novais, S., Indriana, L., Kunzman, A., Slater, M., and Lemos, M. 2017. Thermal stress effects on energy resource allocation and oxygen consumption rate in the juvenile sea cucumber, *Holothuria scabra* (Jaeger, 1833). *Aquaculture*. 467:109-117.

- Kurnianto, D., Indriana, L. F., Wahab, A., Hafid, S., dan Badi, B. F. 2020. Pertumbuhan dan sintasan juvenil teripang pasir *Holothuria scabra* pada pemeliharaan dengan dan tanpa rumput laut *Gracilaria* sp., menggunakan keramba apung dan tancap dengan dan tanpa rumput laut di tambak. *Oseanologi dan Limnologi di Indonesia*. 5(3): 1-9. <https://www.oldi.lipi.go.id/doi/10.14203/oldi.2020.v5i3.340>.
- Kwoji, I.D., Aiyegoro, O.A., Okpeku, M., and Adeleke1, M.A. 2021. Multi-strain probiotics: synergy among isolates enhances biological activities. *Biology (Basel) Pub.Med. Central*. 10(4): 322. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.3390/biology10040322>.
- Laining, A. N., Kabangnga, dan Usman. 2003. Pengaruh protein pakan yang berbeda terhadap koefisien pencernaan nutrisi serta performansi biologis kerapu macan, *Ephinephelus fuscoguttatus* dalam keramba jaring apung. *Jurnal Penelitian Perikanan*. IX (2): 29-34.
- Lawrence, J.M. 1987. Functional Biology of Echinoderm. *Journal of Experimental Marine Biology and Ecology*. 34: 56-67.
- Lawrence, J.M. 1982. Digestion. p. 283-316 In Jangoux, M., and Lawrence, J.M. editors. Echinoderm nutrition. A.A. Balkema, Rotterdam, the Netherlands.
- Leaver, M. J., Villeneuve, L.A.N., Obach, A., Jensen, L., Bron, J. E., Tocher, D. R., and Taggart, J.B. 2008. Functional genomics reveals increased cholesterol and highly unsaturated fatty acid biosynthesis after dietary substitution of fish oil with vegetable oils in Atlantic salmon (*Salmo salar*). *BMC Genomics*. 9: 299. <https://www.bmcgenomics.biomedic/doi/10.1186/1471-2164-9-299>.
- Liang, M., Dong, S., Gao, Q., Wang, F., and Tian, X. 2010. Individual variation in growth in sea cucumber *Apostichopus japonicus* (Selenck) housed individually. *J. Ocean. Univ China*. 9: 291-296.
- Li, J.Q., Tan, B.P., and Mai, K.S. 2009. Dietary probiotic *Bacillus* OJ and *isomaltooligosaccharides* influence the intestine microbial populations, immune responses and resistance to white spot syndrome virus in shrimp (*Litopenaeus vannamei*). *Aquaculture*. 291: 35-40.
- Li, J., Dong, S., Tian, X., Shi, C., Wang, F., Gao, Q., and Zhu, C. 2015. Effects of the diatom *Cylindrotheca fusiformis* on the growth of the sea cucumber *Apostichopus japonicus* and water quality in ponds. *Aquac. Int*. 23(4): 955-965.
- Li, J., Xu, Y., Jin, L., and Li, X. 2015. Effects of a probiotic mixture (*Bacillus subtilis* YB-1 and *Bacillus cereus* YB-2) on disease resistance and non-specific immunity of sea cucumber, *Apostichopus japonicus* (Selenka). *Aquaculture Research*. 46:3008-3019.
- Li, Y.X., Himaya, S.W.A., and Kim, S.K. 2013. Triterpenoids of marine origin as anticancer agents. *Molecules*. 18(7):7886-7909.

- Lisal, J.S. 2005. Konsep Probiotik dan prebiotik untuk modulasi mikrobota intestinum besar. *Medical Nusantara*, 26 Oktober-Desember.
- Liu, Z. M., Ma, Y. X., Yang, Z. P., Li, M., Liu, J., and Bao, P. Y. 2012. Immune responses and disease resistance of the juvenile sea cucumber *Apostichopus japonicus* induced by *Metschnikowia* sp. C14. *Aquaculture*. 368-369: 10-18.
- Liu, J., Han, H., Sun, F., Zhang, C., Cao, S., Zhao, N., and Ma, Y. 2013. Effects of dietary live *Bacillus* sp. BC26 on digestive enzyme activity, immune response and disease resistance against *Vibrio splendidus* infection in juvenile sea cucumber *Apostichopus japonicus*. *Journal of Dalian Ocean University*. 28(6): 568-572.
- Lovell T. 1988. Nutrition and feeding in fish. *Auburn University an AVI, Book*.
- Luna, L. G. 1968. Manual of histological staining methods of the armed forces. Third ed. Institute of Pathology. *McGraw-Hill, New York*, 432 pp.
- Ma, Y. X., Liu, Z. M., Yang, Z. P., Li, M., Liu, J., and Song, J. 2013. Effects of dietary live yeast *Hanseniaspora opuntiae* C21 on the immune and disease resistance against *Vibrio splendidus* infection in juvenile sea cucumber *Apostichopus japonicus*. *Fish and Shellfish Immunology*. 34: 66-73.
- Ma, Y.X., Li, L.Y., Li, M., Chen, W., Bao, P.Y., Yu, Z.C., and Chang, Y.Q. 2019. Effects of dietary probiotic yeast on growth parameters in juvenile sea cucumber, *Apostichopus japonicus*. *Aquaculture*. 499: 203-211.
- MacTavish, T., Stenton-Dozey, J., Vopel, K., and Savage, C. 2012. Deposit feeding sea cucumbers enhance mineralization and nutrient cycling in organically-enriched coastal sediments. *Plos one*. 7(11): e50031. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.1371/journal.pone.0050031>.
- Magcanta, M. L. M., Sornito, M. B., Espadero, A. D. A., Bacosa, H. P., and Uy, W. H. 2021. Growth, Survival, and Behavior of Early Juvenile Sandfish *Holothuria scabra* (Jaeger, 1883) in Response to Feed Types and Salinity Levels under Laboratory Conditions. *Philippine Journal of Science*. 150(5): 871-884.
- Manning, T.S., Rastall, R., and Gibson, G. 2004. Prebiotics and lactic acid bacteria. in: Salminen, S., Wright, A., and Ouwehand, A. editor. *Lactic Acid Bacteria Microbiological and Functional Aspects 3*: 2004; *New York. Marcel Dekker, Inc.* p. 407-418.
- Marsh, D. 2008. Protein modulation of lipids and vice-versa, in membranes. *Biochimica et Biophysica Acta*. 1778: 1545-1575.
- Martoyo, J., Aji, N., dan Winanto, T. 2007. Budidaya teripang. *Penebar Swadaya, Jakarta*. 76 hal.
- Massin, C. 1980. Effects of feeding on the environment: Holothuroidea: Echinoderm nutrition. Rotterdam: *CRC Press*. 493-497p.

- Massin, C. 1982. Effects of feeding on the environment: Holothuroidea. In: Jangoux, M., and Lawrence, J.M. (Eds.) Echinoderm Nutrition. AA Balkema, Rotterdam. p. 493-497.
- Mayer, L.M., Schick, L.L., Self, R.F.L., Jumars, P.A., Findlay, R.H., Chen, Z., and Sampson, S. 1997. Digestive environments of benthic macroinvertebrate guts: enzymes, surfactants and dissolved organic matter. *J. Mar. Res.* 55: 785–812. <https://www.semanticscholar.org/doi/10.1357/0022240973224247>.
- Mercier, A., Battaglene, S.C., and Hamel, J.F. 1999. Daily burrowing cycle and feeding activity of juvenile sea cucumbers *Holothuria scabra* in response to environmental factors. *J. Exp. Mar. Biol. Ecol.* 239: 125-156.
- _____. 2000. Settlement preferences and early migration of the tropical sea cucumber *Holothuria scabra*. *J. Exp. Mar. Biol. Ecol.* 249: 89-110.
- Merrifield, D.L., Dimitroglou, A., Foey, A., Davies, S.J., Baker, R.T.M., Bogwald, J., Castex, M., and Ringo, E. 2010. The current status and future focus of probiotic and prebiotic applications for Salmonids. *Aquaculture*. 302: 1-18.
- Mezali, K., and Soualili, D. L. 2013. The ability of holothurians to select sediment particles and organic matter. *SPC Beche de Mer Information Bulletin*. #33, 38-43.
- Mikutta, R., Kleber, M., Kaiser, K., and Jahn, R. 2005. Review: Organic Matter removal from soils using hydrogen peroxide, sodium hypochlorite, and disodium peroxodisulfate. *Soil Sci. Soc. of Am. J.* 69: 120-135. <https://www.agris.fao.org/doi/10.2136/sssaj2005.0120>.
- Militz, T. A., Leini, E., Duy, N. D. Q., and Southgate, P. C. 2018. Successful large-scale hatchery culture of sandfish (*Holothuria scabra*) using micro-algae concentrates as a larval food source. *Aquaculture Reports*. 9: 25–30.
- Moore, H. M., Manship, B. A. D., and Roberts, D. 1995. Gut structure and digestive strategies in three species of abyssal holothurians. In Emson, R. H., Smith, A. B., and Campbell, A. Echinoderm research. *Proceedings of the fourth European echinoderms colloquium, London, 10-13 April 1995*. (pp. 111-119). Rotterdam: Balkema.
- Mondal, H., and Thomas, J. 2022. A review on the recent advances and application of vaccines against fish pathogens in aquaculture. *Aquaculture International*. 30(5): 1971-2000. <https://www.linkspringer.com/doi/10.1007/s10499-022-00884-w>.
- Myers, P.R., Espinosa, C.S., Parr, T., Jones, G.S., Hammond, and Dewey, T.A. 2019. The Animal Diversity Web (online). Accessed at <https://www.animaldiversity.org>.
- National Research Council (NRC). 1993. Nutrient requirement of fish. *National Academy Press. Washington DC, USA*.

- Nayak, S.K., 2010. Probiotics and immunity: a fish perspective. *Fish Shellfish Immunol.* 29: 2-14.
- Novriadi, R. 2019. Nilai gizi tepung kedelai sebagai substitusi tepung ikan. *Majalah Info Akuakultur.* Edisi No. 48. Tahun IV. Hal. 26-29.
- Nugroho, G.B.S, Hartati, R. dan Praseno, K. 2012. Hitokomparatif organ integumen, intestinum, pohon respirasi pada beberapa jenis teripang dari perairan Karimunjawa. *Journal of Marine Research.* 1(1): 67-74.
- O'mahoney, M., Mouzakis, G., Doyle, J., and Burnell, G. 2011. A novel konjac glucomannan-xanthan gum binder for aquaculture feeds: the effect of binder configuration on formulated feed stability, feed palatability and growth performance of the Japanese abalone, *Haliotis discus hannai*. *Aquaculture Nutrition.* 17: 395-407.
- Orozco, Z.G.A., Sumbing, J.G., Lebata-Ramos, M.J.H., and Watanabe, S. 2014. Apparent digestibility coefficient of nutrients from shrimp, mussel, diatom and seaweed by juvenile *Holothuria scabra* Jaeger. *Aquac. Res.* 45: 1153-1163.
- Paolucci, M., Fabbrocini, A., Volpe, M.G., Varricchio, E., and Coccia, E. 2012. Development of biopolymers as binders for feed for farmed aquatic organisms. In Z. Muchlisin (Ed.), *Aquaculture.* pp. 1-25.
- Pascual, F.P., Bandonil, L., and Destajo, W.H. 1978. The effect of different binders on water stability of feed for prawns. Q. Res. Rep., 1st Q. (Jan-Mar.). *Tigbauan: SEAFDEC Aquaculture Department.* p. 31-35.
- Pangestuti, R., and Arifin, Z. 2018. Medicinal and health benefit effects of functional sea cucumbers. *J. Tradit. Complement Med.* 8(3):341-351.
- Pangkey, H., Lantu, S., Manu, L., and Mokolensang, J.F. 2012. Prospect of sea cucumber culture in Indonesia as potential food sources. *Journal of Coastal Development.* 15(2): 114-124.
- Pawson, D.L. 1966. Ecology of Holothurians. In Boolotian, R.A. (ed.). *Physiology of echinodermata.* New York: Intersci Publ. 63-71.
- Pinsino, A., Thorndyke, M.C., and Matranga, V. 2007. Coelomocytes and post-traumatic response in the common sea star *Asterias rubens*. *Cell Stress & Chaperones.* 12(4):331-341.
- Pitt, R., and Duy, N.D.Q. 2004. Breeding and rearing of the sea cucumber *Holothuria scabra* in Vietnam. *Advances in Sea cucumber aquaculture and management.* *FAO Fisheries Technical Paper.* 463:333-346.
- Plotieau, T., Baele, J.M., Vaucher, R., Hasler, C.A., Koudad, D., and Eeckhaut, I. 2013. Analysis of the impact of *Holothuria scabra* intensive farming on sediment. *Cahiers de Biologie Marine.* 54: 703-711.
- Price, S.A., and Wilson, L.M. 1995. Pathophysiology: Clinical concepts of disease processes. Edition 4. Jakarta, *Medical Book Publisher EGC.* 357-411.

- Promptoon, Y., Weerachatanukul, W., Withyachumnarnkull, B., Vanichviriyakit, R., Wongprasert, K., and Asuvapongpatana, S. 2015. Lectin-Based profiling of coelomocytes in *Holothuria scabra* and expression of superoxide dismutase in purified coelomocytes. *Zoological Science*. 32(4): 345-351.
- Purcell, S.W. 2010. Managing sea cucumber fisheries with an ecosystem approach. *FAO Fisheries and Aquaculture Technical Paper. No. 520. Rome, FAO*. 157 pp.
- Purcell, S.W. 2014. Value, market preferences and trade of beche-de-mer from Pacific island sea cucumber. *PLoS One*. 9:e95075. <https://www.journals.plos.org/doi/10.1371/journal.pone.0095075>.
- Purcell, S. W., and Kirby, D. S. 2006. Restocking the sea cucumber *Holothuria scabra*: Sizing no-take zones through individual-based movement modelling. *Fisheries Research*. 80(1): 53-61.
- Purcell, S.W., Patroism, J., and Fraisse, N. 2006. Experimental evaluation of co-culture of juvenile sea cucumbers, *Holothuria scabra* (Jaeger), with juvenile blue shrimp, *Litopenaeus stylirostris* (Stimpson). *Aquac. Res*. 37(5): 515-522.
- Purcell, S. W., Polidoro, B. A., Hamel, J.F., Gamboa, R. U., and Mercier, A. 2014. The cost of being valuable: predictors of extinction risk in marine invertebrates exploited as luxury seafood. *Proceedings of the Royal Society B* 281:20133296. <https://www.asu.pure.es/levier.com/doi/10.1098/rspb.2013.3296>.
- Purcell, S.W., Samyn, Y., and Conand, C. 2012. Commercially important sea cucumbers of the world. *FAO Species Catalogue for Fishery Purposes. No 6. Rome*. 150 pp.
- Puvanasundram, P., Chong, C.M., Suriana Sabri, S., Yusoff, S.M., and Karim, M. 2021. Multi strain probiotics: functions, effectiveness and formulations for aquaculture applications. *Aquaculture Reports*. 21: 14 pp. <https://www.sciencedirect.com/doi/10.1016/j.aqrep.2021.100905>.
- Qi, W., Xiumei, Z., Muyan, C., Wentao, L., and Peidong, Z. 2018. Comparison of intestinal microbiota and activities of digestive and immune-related enzymes of sea cucumber *Apostichopus japonicus* in two habitats. *Journal of Oceanology and Limnology*. 36 (3):990-1001. <https://www.link.springer.com/doi/10.1007/s00343-018-7075-z>.
- Qin, C., Dong, S., Tan, F., Tian, X., Wang, F., Dong, Y., and Gao, Q. 2009. Optimization of stocking density for the sea cucumber, *Apostichopus japonicus* Selenka under feedsupplement and non-feed-supplement regimes in pond culture. *Journal of Ocean University of China*. 8(3): 296–302. <https://www.link.springer.com/article/10.1007/s11802-009-0296-1>.

- Qiyou, X., Qing, Z., Hong, X., Chang'an, W., and Dajiang, S. 2011. Dietary glutamine supplementation improves growth performance and intestinal digestion/absorption ability in young hybrid sturgeon (*Acipenser schrenckii* female x *Huso dauricus* male). *Journal of Applied Ichthyology*. 27(2): 721-726. <https://www.sciencedirect.com/doi/10.1111/j.1439-0426.2011.01710.x>.
- Ramirez-Gomez, F., & Garcia-Arraras, J. E. 2010. Echinoderm immunity. *Invertebrate Survival Journal*. 7(2): 211-220.
- Raskovic, B.S., Stankovic, M.B., Markovic, Z.Z., and Poleksic, V.D. 2011. Histological Methods in the assessment of different feed effects on liver and intestine of fish. *J. Agric. Sci.* 56:87-100.
- Rasyid, A., Murniasih, T., Putra, M.Y., Pangestu, R., Harahap, I.A., Untari, F., and Sembiring, S.B.M. 2020. Evaluation of nutritional value of sea cucumber *Holothuria scabra* cultured in Bali, Indonesia. *AACL Bioflux*. 13(4): 2083-2093. <https://www.bioflux.com.ro/aac1>.
- Rathinam, R.B., Ibrahima, S.A., and Tripathi, G. 2020. The immune system of sea cucumbers: An evidential approach. *Food and Scientific Reports*. 1(12): 49-54.
- Rengpipat, S., Rukpratanporn, S., Piyatiratitivorakul, S., and Menasaveta, P. 2000. Immunity enhancement in black tiger shrimp (*Penaeus monodon*) by a probiont bacterium (*Bacillus* S11). *Aquaculture*. 191(4): 271-288.
- Richmond, R.H., Hopper, D., and Martinez, P. 1996. The biology and ecology of sea cucumbers. In: R.H. Richmond (ed.) Suggestions for the management of sea cucumber resources in Micronesia. *University of Guam Marine Laboratory Technical Report* No. 101, 75 p.
- Ridhowati, S., and Asnani. 2015. Amino acids and fatty acids profile of processed sandfish (*Holothuria scabra*) in Belitung. *Journal of Mathematics, Saint, and Technology*. 16(2): 20-27. <https://www.senmaster.ut.ac.id/index.php/jmst/article/view/232/214>.
- Ridwanudin, A., Indriana, L.F., and Kunzman, A. 2018. No differences in nutritional profiles of wild and cultured juvenile sandfish, *Holothuria scabra*. *Annual Research & Review in Biology*. 26(5): 1-11. <https://www.leibniz-zmt.de/doi/10.9734/ARRB/2018/41457>.
- Ridzwan, B., Hanita, M., Nurzafirah, M., SitiNorshuhadaa, M., and Hanis Farah, Z. 2014. Free fatty acids composition in lipid extracts of several sea cucumbers species from Malaysia. *International Journal of Bioscience, Biochemistry and Bioinformatics*. 4: 204-207. <https://www.ijbbb.org/doi/10.7763/IJBBB.2014.V4.340>.
- Rust, M.B. 2003. Nutritional physiology. In: Halver JE, Hardy RW (eds). *Fish nutrition*, 3rd Edition. New York, Academic Press Inc. pp. 367- 452
- Roberts, D. 1979. Deposit feeding mechanisms and resource partitioning in tropical holothurians. *J. Exp. Mar. Biol. Ecol.* 15: 69-80.

- Roberts, D., and Bryce, C. 1982. Further observations on tentacular feeding mechanisms in Holothurians. *J. Exp. Mar. Biol. Ecol.* 59: 151-163. [https://www.sciencedirect.com/doi/10.1016/0022-0981\(82\)90112-5](https://www.sciencedirect.com/doi/10.1016/0022-0981(82)90112-5).
- Roberts, D., and Moore, H.M., 1997. Tentacular diversity in deep-sea deposit-feeding holothurians: implications for biodiversity in the deep sea. *Biodivers. Conserv.* 6: 1487-1505.
- Roberts, D., Moore, H.M., Berges, J., Patching, J.W., Carton, M.W., and Eardly, D.F. 2001. Sediment distribution, hydrolytic enzyme profiles and bacterial activities in the guts of *Oneirophanta mutabilis*, *Psychropotes longicauda* and *Pseudostichopus villosus*: what do they tell us about digestive strategies of abyssal holothurians? *Prog. Oceanogr.* 50: 443-458.
- Robinson, G., Slater, M.J., Jones, C.L.W., and Stead, S.M. 2013. Role of sand as substrate and dietary component for juvenile sea cucumber *Holothuria scabra*. *Aquaculture*. 392-395: 23-25.
- Robbins, K.R., Saxton, A.M., and Southern, L.L., 2006. Estimation of nutrient requirements using brokenline regression analysis. *Journal of Animal Science*, 84 (E. Suppl.): E155-E165. https://www.pubmed.ncbi.nlm.nih.gov/doi/10.2527/2006.8413_supple155x.
- Rodriguez, J.A.V., and Guerra, C.A.A. 2016. Ulva genus as alternative crop: Nutritional and functional properties. In Konvalina, P. (Ed.). *Alternative Crops and Cropping Systems. eBook, Publiher In Tech*. p. 26-44.
- Romadhon, I., Kurnia, N. Komar, dan Yulia-ningsih, R. 2013. Desain optimal pengolahan sludge padat biogas sebagai bahan baku pelet pakan ikan lele. *Fakultas Teknologi Pertanian. Universitas Brawijaya, Malang*.
- Rowe, F.W.E. 1969. A review of the family Holothuridae (Holothurioidea: Aspidochirotida). *Bulletin of the British Museum of Natural History (Zoology)*. 18: 119-170.
- Saade, E., dan Aslamyiah, S. 2009. Uji fisik dan kimiawi pakan buatan untuk udang windu *Penaeus monodon* Fab. Yang menggunakan berbagai jenis rumput laut sebagai bahan perekat. *Torani (Jurnal Ilmu Kelautan dan Perikanan)*. 19 (2): 107 – 115.
- Saleela, K.N., B. Somanath., and Palavesam. 2009. Effects of binders on stability and palatability of formulated dry compounded diet for spiny lobster *Panulirus homarus* (Linnaeus, 1758). *Indian J. Fish.* 62(1): 95-100.
- Sargent, J.R., Tocher, D.R., and Bell, J.G. 2002. The lipids. In: Halver JE, Hardy RW (Eds) *Fish Nutrition*, 3rd Ed. *Elsevier (Academic Press), San Diego, California*. p. 181-257.
- Seeruttun, R., Appadoo, C., Laxminarayana, A., and Codabaccus, B. 2007. A study on the factors influding the growth and survival of juvenile sea cucumber, *Holothuria atra*, under laboratory conditions. *National Ocean Science Forum 2007 Programme and Abstracts*. 13 pp.

- Schmittgen, T.D., and Livak, K.J. 2008. Analyzing real time PCR data by the comparative Ct method. *Nature Protocols*. 3: 1101-1108.
- Schrezenmeir, J., and Vrese, M. 2001. Probiotics, Prebiotics and Synbiotic- Approaching a definition. *American Journal of Clinical Nutrition*. 73(2):361-364.
- Seo, J.Y., and Lee, S.M. 2010. Optimum dietary protein and lipid levels for growth of juvenile sea cucumber *Apostichopus japonicus*. *Aquac. Nutr.* 17(2):56-61.
- Seo, J.Y., Shin, I.S., and Lee, S.M. 2011. Effect of dietary inclusion of various plant ingredients as an alternative for *Sargassum thunbergii* on growth and body composition of juvenile sea cucumber *Apostichopus japonicus*. *Aquac. Nutr.* 17: 549-556.
- Sembiring, S.B.M., Hutapea, J.H., Sugama, K., Susanto, B., Giri, N.A., dan Haryanti. 2015. Teknik perbenihan teripang pasir *Holothuria scabra*. Dalam: Rekomendasi Teknologi Kelautan dan Perikanan 2015 (Soekadi, F., Sugama, K., Nurhakim, S., Heruwati, E.S., Purba, M., Kusnendar, E., Djunaidah, I.S., Sudibjo, E.R., dan Sakti, I. Eds.). *Badan Litbang Kelautan dan Perikanan, Kementerian Kelautan dan Perikanan. Jakarta*. Hal. 187-200.
- Sembiring, S.B.M., Wardana, I.B., dan Haryanti. 2016. Performa benih teripang pasir, *Holothuria scabra* dari sumber induk yang berbeda. *Jurnal Riset Akuakultur*. 11(2): 147-156.
- Sembiring, S. B. M., Hutapea, J. H, Giri, I.N.A., Hadisusanto, S., Pratiwi, R., Haryanti., 2021. Isolating and characterizing bacteria in the intestine of wild sandfish, *Holothuria scabra* as probiotics candidate. In: Proceedings of the 2nd International Conference on Fisheries and Marine, *IOP Conf. Series: Earth and Environmental Science* 890. 10 pp. <https://www.iopscience.iop.org/doi/10.1088/1755-1315/890/1/012023>.
- Setyastuti, A., dan Purwati, P. 2015. Species list of Indonesian Teripang. *SPC Bechedemer Information Bulletin*. 35:19-25.
- Shearer, K. 1994. Factors affecting the proximate composition of cultured fishes with emphasis on salmonids. *Aquaculture*. 119: 63-88.
- Shi, C., Dong, S.L., Pei, S., Wang, F., Tian, X.L., and Gao, Q.F. 2015. Effects of diatom concentration in prepared feeds on growth and energy budget of the sea cucumber *Apostichopus japonicus* (Selenka). *Aquac Res.* 46: 609-617.
- Sibuet, M., Khripounoff, A., Deming, J., Colwell, R., and Dinot, A. 1982. Modification of the gut contents in the digestive tract of abyssal Holothurians. In Lawrence J. M. (Ed.), *Echinoderms: Proceedings of the International Conference, Tampa Bay* (pp. 421-428). Rotterdam, Netherlands: Balkema.

- Simon, R., Docando, F., Nunez-Ortiz, N., Tafalla, C., and Diaz-Rosales, P. 2021. Mechanisms used by probiotics to confer pathogen resistance to teleost fish. *Front Immunol.* 12. <https://www.frontiersin.org/doi/10.3389/fimmu.2021.653025>.
- Sinsona, M. J., and Juinio-Meñez, M. A. 2018. Effects of sediment enrichment with macroalgae, *Sargassum* spp., on the behavior, growth, and survival of juvenile sandfish, *Holothuria scabra*. *Aquaculture Reports*, 12: 56-63.
- Sithisak, P., Pongtippatee, P., and Withyachumnarnkul, B. 2013. Improving inland culture performance of juvenile sea cucumbers, *Holothuria scabra*, by co-culture with red tilapia. *Songklanakarin Journal of Science and Technology.* 35(5): 501-505. Retrieved from <https://www.thaiscience.info/rdo.psu.ac.th/sjstweb/journal>.
- Siwi, N.N. 2011. Observasi awal struktur dan profil villi saluran pencernaan teripang hitam (*Holothuria atra*). Skripsi. Fakultas Perikanan dan Ilmu Kelautan. Universitas Diponegoro. Tidak Dipublikasikan. 58 hal.
- Skewes, T., Haywood, M., Pitchern, R., and Willan, R. 2004. *Holothurians. National Oceans Office, Hobart, Australia.*
- Slater, M.J., and Carton, A.G. 2007. Survivorship and growth of the sea cucumber, *Australostichopus* (*Stichopus*) *mollis* (Hutton 1872) in polyculture trials with green-lipped mussel farms. *Aquaculture.* 272: 389-398.
- Slater, M.J., Jeffs, A.G., and Carton, A.G. 2009. The use of the waste from green-lipped mussels as a food source for juvenile sea cucumber, *Australostichopus mollis*. *Aquaculture.* 292 (3): 219-224.
- Slater, M. J., Lassudrie, M., and Jeffs, A. G. 2011. Method for determining apparent digestibility of carbohydrate and protein sources for artificial diets for juvenile sea cucumber, *Australostichopus mollis*. *J. World. Aquac. Soc.* 42: 714-725.
- Smiley, S. 1994. Holothuroidea, in *Microscopic anatomy of invertebrates*, Harrison, F.W. and Chia, F.S., Eds., New York: Wiley-Liss. vol. 14: 401-472.
- Smith, V.J. 1981. The Echinoderms, in *Invertebrate Blood Cells. London: Academic Press.* p. 513-562.
- Sun, H., Liang, M., Yan, J., and Chen, B. 2004. Nutrient requirements and growth of the sea cucumber, *Apostichopus japonicus*. In: *Advances in sea cucumber aquaculture and management* (Lovatelli, A., Conand, C., Purcell, S., Uthicke, S., Hamel, J.F. and Mercier, A. Eds.), p. 327-331.
- Sun, Y.Z., Yang, H.L., Ma, R.L., and Lin, W.Y. 2010. Probiotic applications of two dominant gut *Bacillus* strains with antagonistic activity improved the growth performance and immune responses of grouper *Epinephelus coioides*. *Fish Shellfish Immunol.* 29: 803-809.

- Sun, J., Zhang, L., Pan, Y., Lin, C., Wang, F., Kan, R., and Yang, H. 2015. Feeding behavior and digestive physiology in sea cucumber *Apostichopus japonicus*. *Physiol. Behav.* 139: 336-343.
- Sun, J. M., Zhang, L. B., Pan, Y., Lin, C. G., Wang, F., and Yang, H. S. 2018. Effect of water temperature on diel feeding, locomotion behaviour and digestive physiology in the sea cucumber *Apostichopus japonicus*. *Journal of Experimental Biology*. 221: jeb177451. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.1242/jeb.177451>.
- Storebakken, T. 1985. Binders in fish feeds: I. Effect of alginate and guar gum on growth, digestibility, feed intake and passage through the gastrointestinal tract of rainbow trout. *Aquaculture*. 47: 11-26.
- Taboada, M.C., Gonzalez, M., and Rodriguez, E. 2003. Value and effects on digestive enzymes and serum lipids of the marine invertebrate *Holothuria forskali*. *Nutrition Research*. 23: 1661-1670. [https://www.sciencedirect.com/doi/10.1016/S0271-5317\(03\)00175-1](https://www.sciencedirect.com/doi/10.1016/S0271-5317(03)00175-1).
- Takeuchi, T., 1988. Laboratory workchemical evaluation of dietary nutrient. In Watanabe, T. (Eds.). Fish nutrition and mariculture. *JICA Kanagawa International Fisheries Training Centre*. Tokyo. p. 179-233.
- Tangestani, M., and Kunzmann, A. 2019. Isolation and characterization of bacteria from the lesion of juvenile Sea cucumber *Holothuria scabra* (Jaeger, 1938) with symptom of skin ulceration disease. *Iranian Journal of Fisheries Science*. <https://www.jifro.ir/doi/10.22092/ijfs.2019.118391>.
- Tian, X. L., Zhao, K., Wang, J., Yang, G., and Yan, F. J. 2015. Influence of water additive and feed supplementary *Bacillus cereus* on the growth and activity of digestive and immune relating enzyme of sea cucumber. *Periodical of Ocean University of China*. 45 (1): 18-25.
- Tomatala, P., Haryadi, D., Arianto, D., dan Pattiwael. S. 2022. Efektifitas metode pendederan juvenile teripang di hatchery skala rumah tangga. *Jurnal Triton*. 18(1): 20-27. <https://www.ojs3.unpatti.ac.id/doi/10.30598/TRITONvol18issue1page20-27>.
- Usman, Palinggi, N.N., dan Giri, N. A. 2003. Pemanfaatan beberapa jenis karbohidrat bagi pertumbuhan dan efisiensi pakan yuwana ikan kerapu bebek (*Cromileptes altivelis*). *Jurnal Penelitian Perikanan Indonesia*. 9(2): 21-28.
- Uthicke, S. 2001. Nutrient regeneration by abundant coral reef holothurians. *Journal of Experimental Marine Biology and Ecology*. 265: 153-170.
- Uthicke, S., and Karez, R. 1999. Sediment patch selectivity in tropical sea cucumbers (Holothurioidea: Aspidochirotida) analyzed with multiple choice experiments. *Journal of Experimental Marine Biology and Ecology*. 236: 69-87.
- Uthicke, S., and Klumpp, D. W. 1998. Microphytobenthos community production at a near-shore coral reef: Seasonal variation and response to ammonium recycled by holothurians. *Marine Ecology Progress Series*. 169: 1-11.

- Van Herreweghe, J.M., and Michiels, C.W. 2012. Invertebrate lysozymes: diversity and distribution, molecular mechanism and in vivo function. *Journal of Biosciences (Tuebingen)* 37(2): 327-332. <https://www.pubmed.ncbi.nlm.nih.gov/doi/10.1007/s12038-012-9201-y>.
- Verschuere, L., Rombaut, G., Sorgeloos, P., and Vertraete, W. 2000. Probiotics bacteria as biological control agents in aquaculture. *Microbiol. Mol. Biol. Rev.* 64: 655-671.
- Villalta, M., Estevez, A., Bransden, M. P., and Bell, J. G. 2008. Arachidonic acid, arachidonic/eicosapentaenoic acid ratio, stearidonic acid and eicosanoids are involved in dietary-induced albinism in Senegal sole (*Solea senegalensis*). *Aquaculture Nutrition*. 14: 120-128.
- Walkley, A. J., and Black, I. A. 1934. Soil organic carbon, Walkley-Black method: titration and colorimetric method. *Global Soil Laboratory Network*. 27 pp.
- Wang, H., Liu, C.F., Qin, C.X., Cao, S.Q., and Ding, J. 2007. Using a macroalgae *Ulva pertusa* biofilter in a recirculating system for production of juvenile sea cucumber *Apostichopus japonicus*. *Aquaculture Engineering*. 36(3): 217-224.
- Wang, J., Jiang, X., and Zhao, L. 2008. Effects of dietary protein sources on growth in juvenile sea cucumber (*Apostichopus japonicus*). *Feed Rev.* 10: 9-13.
- Wang, J. H., Zhao, L. Q., Liu, F., Wang, H., and Xiao, S. 2015. Effect of potential probiotic *Rhodotorula benthica* D30 on the growth performance, digestive enzyme activity and immunity in juvenile sea cucumber *Apostichopus japonicus*. *Fish and Shellfish Immunology*. 43: 330-336.
- Wang, Q.Z., Cui, Y., Sen, B., Ma, W.M., Zheng, R.L., Liu, X.H., and Wang, G.Y. 2017. Characterization and robust nature of newly isolated oleaginous marine yeast *Rhodospiridium* spp. from Coastal Water of Northern China. *AMB. Express* 7:30. <https://www.amb-express.springer.com/doi/10.1186/s13568-017-0329-x>.
- Wang, G., Meng, Z., Chen, L., Jiang, J., Feng, Y., and Zhang, B. 2019. Effects of kelp residues fermented with probiotics on the culture of sea cucumber, *Apostichopus japonicus*. *Aquac. Res.* 51(3): 1133-1142. <https://www.agris.fao.org/doi/10.1111/are.14460>.
- Wang, Y.B., Xu, Z.R., and Xia, M.S. 2007. Effect of probiotics on growth performance and digestive enzyme activity of the shrimp *Penaeus vannamei*. *Aquaculture*. 269: 259-264.
- Wang, Y.B., Li, J. R., and Lin, J. 2008. Probiotics in aquaculture: Challenges and outlook. *Aquaculture*. 281: 1-4. <https://www.elsevier.com/doi/10.1016/aquaculture.2008.06.002>
- Watson, A.K., Kaspar, H., Lategan, M.J., and Gibson, L. 2008. Probiotics in aquaculture the need, principles and mechanisms of action and screening processes. *Aquaculture*. 274: 1-14.

- Watanabe, S., Kodama, M., Zarate, J.M., Lebata-Ramos, M.J., and Nievaes, M.F. 2012. Ability of sandfish (*Holothuria scabra*) to utilize organic matter in black tiger shrimp ponds. *Proc. Asia Pac. Trop. Sea Cucumber Aquac. Aust. Cent. Int. Agric. Res. Canberra*. p.113-120.
- Weerd, V. H. J. and Komen, J. 1998. The effects of chronic stress on growth in fish: a critical appraisal. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*. Vol 120: 107-112.
- Wiedemeyer, W.L. 1992. Feeding behaviour of two tropical holothurians, *Holothuria (Metriatyla) scabra* (Jaeger 1833) and *H. (Halodeima) atra* (Jaeger 1833), from Okinawa, Japan. In: *Proceedings of the 7th International Coral Reef Symposium, Mangilao Guam. Richmond R.H. (ed). University of Guam Press*. p. 853-860.
- Wilson, R. 2002. Amino acids and proteins. In: *Fish Nutrition* (Eds. by Halver, J.E., and Hardy, R.W.). *Academic press, New York*. p.140-175.
- Wing, S.R., McLeod, R.J., Clark, K.L., and Frew, R.D. 2008. Plasticity in the diet of two echinoderm species across an ecotone: microbial recycling of forest litter and bottom-up forcing of population structure. *Marine Ecology Progress Series*. 360: 115-123.
- Wolkenhauer, S.M. 2008. Burying and feeding activity of adult *Holothuria scabra* (Echinodermata: Holothuroidea) in a controlled environment. *SPC Beche de Mer Information Bulletin*. 27: 25-28.
- Wood, E.J.F., Odum, W.E. and Zieman, J.C. 1969. Influence of the seagrasses on the productivity of coastal lagoons, laguna Costeras. Un Simposio Mem. Simp. Intern. U.N.A.M. UNESCO, Mexico, D.F., Nov. 1967. pp 495-502.
- Wong, K.H., and Cheung, P.C. 2000. Nutritional evaluation of some subtropical red and green seaweeds I. proximate composition, amino acid profiles and some physico-chemical properties. *Food Chem*. 71:475-482.
- Worthington, V. 1993. Worthington Enzyme Manual. Enzymes and Related Biochemicals. *Worthington Chemical Corp., New Jersey, US*, 399 pp.
- Wulandari, D.A., Gustini, N., Muniarsih, T., Bayu, A., Sari, M., Syahputra, G., Harahap, I.A., Rasyid, A., Moria, S.B., Rahmawati, S.I., Izzati, F.N., Septiana, E., Rachman, F., and Putra, M.Y. 2022. Nutritional value and biological activities of sea cucumber *Holothuria scabra* cultured in the pond system. *Journal of Aquatic Food Product Technology*, 16 pp. <https://www.tandfonline.com/doi/10.1080/10498850.2022.2082902>.
- Wu, B., Xia, S., Rahman, M.M., Rajkumar, M., Fu, Z., Tan, J., and Yang, A. 2015. Substituting seaweed with corn leaf in diet of sea cucumber (*Apostichopus japonicus*): Effects on growth, feed conversion ratio and feed digestibility. *Aquaculture*. 444: 88-92.

- Xia, S., Yang, H., Li, Y., Liu, S., Zhou, Y., and Zhang, L. 2012. Effects of different seaweed diets on growth, digestibility, and ammonia-nitrogen production of the sea cucumber *Apostichopus japonicus* (Selenka). *Aquaculture*. 338: 304-308.
- Xia, S., Zhao, W., Li, M., Zhang, L., Sun, L., Liu, S., and Yang, H. 2017. Effects of dietary protein levels on the activity of the digestive enzyme of albino and normal *Apostichopus japonicus* (Selenka). *Aquaculture Research*. 49(3): 1302-1309. <https://onlinelibrary.wiley.com/doi/10.1111/are.13585>.
- Xia, B., Wang, J. Y., Gao, Q. F., Sun, Y. Z., Zhang, L. M., Ma, J. J., and Liu, X. Q. 2015. The nutritional contributions of dietary protein sources to tissue growth and metabolism of sea cucumber *Apostichopus japonicus* (Selenka): Evidence from nitrogen stable isotope analysis. *Aquaculture*: 435: 237-244. <https://www.sciencedirect.com/doi/10.1016/j.aquaculture.2014.09.042>.
- Xilin, S. 2004. The progress and prospects of studies on artificial propagation and culture of the sea cucumber, *Apostichopus japonicus*. Workshop on advances in sea cucumber aquaculture and management. Rome: FAO. p. 273-276.
- Xu, W., Mai, K.S., Ai, Q.H., Tan, B.P., Zhang, W.B., Ma, H.M., and Liufu, Z.G., 2011. Influence of 18: 2n-6/20:5n-3 ratio in diets on growth and fatty acid composition of juvenile abalone, *Haliotis discus hannai* Ino. *Aquac. Nutr.* 17: 346-351.
- Yamanouchi, T. 1956. The daily activity rhythms of the holothurians in the coral reef of Palao Islands. *Publ. Seto. Mar. Biol. Lab.* 5:347-362.
- Yan, F.J., Tian, X.L., Dong, S.L., Fang, Z.H. and Yang, G. 2014. Growth performance, immune response, and disease resistance against *Vibrio splendidus* infection in juvenile sea cucumber *Apostichopus japonicus* fed a supplementary diet of the potential probiotic *Paracoccus marcusii* DB11. *Aquaculture*. 420-421:105-111.
- Yang, Z. P., Sun, J. M., Xu, Z., Zhang, C. C., and Zhou, Q. 2014. Beneficial effects of *Metschnikowia* sp. C14 on growth and intestinal digestive enzymes of juvenile sea cucumber *Apostichopus japonicus*. *Animal Feed Science and Technology*. 197: 142-147.
- Yang, Z.P., Sun, J.M., and Xu, Z. 2015. Beneficial effects of *Rhodotorula* sp. C11 on growth and disease resistance of juvenile Japanese spiky sea cucumber, *Apostichopus japonicus*. *J. Aquat. Anim. Health*. 27(2): 71-76. <https://www.pubmed.ncbi.nlm.nih/doi/10.1080/08997659.2014.993483>.
- Yang, H., Han, Y. Z., Ren, T. J., Jiang, Z. Q., Wang, F. Q., and Zhang, Y. T. 2016. Effects of dietary heat-killed *Lactobacillus plantarum* L-137 (HK L-137) on the growth performance, digestive enzymes and selected non-specific immune responses in sea cucumber, *Apostichopus japonicus* Selenka. *Aquaculture Research*. 47 (9): 2814-2824.

- Yingst, J.Y. 1976. The utilization of organic matter in shallow marine sediments by an epibenthic deposit-feeding holothurian. *J. Exp. Mar. Biol. Ecol.* 23 (1): 55-69.
- Yu, H.B., Gao, Q.F., Dong, S.L., and Wen, B. 2015. Changes in fatty acid profiles of sea cucumber *Apostichopus japonicus* (Selenka) induced by terrestrial plants in diets. *Aquaculture*. 442: 119-124.
- Yuan, X., Yang, H., Zhou, Y., Mao, Y., Zhang, T., and Liu, Y. 2006. The influence of diets containing dried bivalve feces and/or powdered algae on growth and energy distribution in sea cucumber *Apostichopus japonicus* (Selenka) (Echinodermata: Holothuroidea). *Aquaculture*. 256(1-4): 457-467. <https://www.infona.pl/doi/10.1016/j.aquaculture.2006.01.029>.
- Zacarias-Soto, M., and Olvera-Novoa, M. 2015. Effect of different diets on body biochemical composition of the four-sided sea cucumber, *Isostichopus badionotus*, under culture conditions. *Journal World Aquaculture Society*. 46(1): 45-52. <https://www.semanticscholar.org/doi/10.1111/jwas.12163>.
- Zamora, L.N., and Jeffs, A.G. 2011. Feeding, selection, digestion and absorption of the organic matter from mussel waste by juveniles of the deposit-feeding sea cucumber, *Australostichopus mollis*. *Aquaculture*. 317 (1): 223-228.
- Zettl, S., Cree, D. Soleimani, M., and Tabil, L. 2019. Mechanical properties of aquaculture feed pellets using plant-based proteins. *Cogent Food & Agriculture*. 5:1656917.
- Zhao, Y., Ma, H., Zhang, W., Ai, Q., Mai, K., and Xu, W. 2011. Effects of dietary β -glucan on the growth, immune responses and resistance of sea cucumber, *Apostichopus japonicus* against *Vibrio splendidus* infection. *Aquaculture*. 315: 269-274.
- Zhao, K., Tian, X. L., Dong, S. L., Li, J., and Wang, W. J. 2015. Effects of different states of *Bacillus cereus* on growth digestive enzyme activity and the immune defense factors of *Apostichopus japonicus*. *Transactions of Oceanology and Limnology*. 1: 63-72.
- Zhao, Y.C., Zhang, W.B., Xu, W., Mai, K.S., Zhang, Y.J., and Liu, Z.G. 2012. Effects of potential probiotic *Bacillus subtilis* T13 on growth, immunity and disease resistance against *Vibrio splendidus* infection in juvenile sea cucumber *Apostichopus japonicus*. *Fish & Shellfish Immunology*. 32: 750-755.
- Zhao, Y.C., Yuan, L., Wan, J.L., Sun, Z.X., Wang, Y.Y., and Sun, H.S. 2016. Effects of probiotic *Bacillus cereus* EN25 on growth, immunity and disease resistance of juvenile sea cucumber *Apostichopus japonicus*. *Fish & Shellfish Immunol.* 49: 237-242. <https://www.pubmed.ncbi.nlm.nih/doi/10.1016/j.fsi.2015.12.035>.

- Zhang, Q., Ma, H.M., Mai, K.S., Zhang, W.B., Liu, Z.G., and Xu, W. 2010. Interaction of dietary *Bacillus subtilis* and fructooligosaccharide on the growth performance, non-specific immunity of sea cucumber, *Apostichopus japonicus*. *Fish & Shellfish Immunology*. 29: 204-211.
- Zhang, X., Nakahara, T., Miyazaki, M., Nogi, Y., and Kudo, T. 2012. Diversity and function of aerobic culturable bacteria in the intestine of the sea cucumber *Holothuria leucospilota*. *J. Gen. Appl. Microbiol.* 58: 447-456. <https://pubmed.ncbi.nlm.nih.gov/doi/10.2323/jgam.58.447>.
- Zhou, X., Niu, C., and Li, Q. 2000. Effects of light on feeding behavior, growth and survival of aquatic animals. *Acta Hydrobiol Sin.* 2: 178-181.
- Zhou, Q.C., and Yue, Y.R. 2010. Effect of replacing soybean meal with canola meal on growth, feed utilization and haematological indices of juvenile hybrid tilapia, *Oreochromis niloticus*. *Aquac. Res.* 41: 982-990.
- Ziaei-Nejad, S., Rezaei, M.H., Takami, G.A. and Lovett, D.L. 2006. Effect of *Bacillus* spp. Bacteria used as probiotics on digestive enzym activity, survival and growth in the Indian White shrimp (*Fenneropenaeus indicus*). *Aquaculture*. 252: 516-524.