

DAFTAR PUSTAKA

- Aam, B. B., Heggset, E. B., Norberg, A. L., Sørlie, M., Vårum, K. M., dan Eijsink, V. G. 2010. Production of chitooligosaccharides and their potential applications in medicine. *Marine drugs* 8: 1482–1517.
- Alshesri, W.A., Elhamshary, O.I., dan Alqourashy, N.H. Chitinolytic Bacteria Producing Enzyme Against Insect and Fungal Plant Pathogens. *Indian Journal of Research* 5(8): 449-450
- Antonino, R.S.C.M.Q., Fook, B.R.P.L., Lima, V.A.I, Rached, R.I.F, Lima, E.P.N., Lima, R.J.S, Covas, C.A.P, dan Fook, M.V.L. 2017. Preparation and Characterization of Chitosan Obtained from Shells of Shrimp (*Litopenaeus vannamei* Boone). *Marine drugs* 15 (5):141.
- Arif, A.R., Ischaidar, Natsir, H., dan Dali, S. 2013. Isolasi Kitin dari Limbah udang Putih (*Penaeus merguiensis*) secara Enzimatis. Seminar Nasional Kimia. hlm 10-16.
- Association of Official Analytical Chemists (AOAC). 2000. “Official Methods of Analysis” 17th ed. Inc., Washington D. C.
- Association of Official Analytical Chemists (AOAC). 2005. “Official Methods of Analysis” 18th ed. Inc., Washington D. C.
- Austin, P.R. 1988. Chitin Solution dan Purification of Chitin. *Methods of Enzymologi* 161: 403-407.
- Badan Standarisasi Nasional (BSN). 2006. SNI 01-2728.1-2006 tentang Udang Segar – Bagian 1: Spesifikasi. hlm 2-4.
- Badan Standarisasi Nasional (BSN). 2015. SNI 2332.7:2015 tentang Cara Uji Mikrobiologi – Bagian 7: Perhitungan kapang dan khamir pada produk perikanan. hlm 2-3.
- Brackishwater Aquaculture Information System (BRAIS). 1988. The Biology and Culture of *Penaeus monodon*. Aquaculture Department Southeast Asian Fisheries Development Center. Iloilo, Philipines. hlm 3-7.
- Bradford, M.M. 1976. A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Analytical Biochemistry* 72:248-254.

- Brzezinska, M.S., Lalke-Porczyk, E., Donderski, W., dan Walczak, M. 2008. Occurrence and Activity of Microorganism in Shrimp Waste. *Current Microbiology* 57(6):580-587.
- Duo-Chuan, L. 2006. Review of Fungal Chitinases. *Mycopathologia* 161(6):345-360.
- Dutta, P.K., Dutta, J., dan Tripathi, V.S. 2004. Chitin and Chitosan: Chemistry, Properties, and Applications. *Journal of Scientific and Industrial Research* 63:20-31.
- Faramarzi, M.A., Fazeli, M., Yazdi, M.T., Adrangi, S., Al-Ahmadi, K.J., Tasharrofi, N., dan Mohseni, F.A. 2009. Optimization of Cultural Condition for Production Chitinase by Soil Isolate of *Massilia timonae*. *Journal of Biotechnology*. 8(1):93-99.
- Fohcher, B., Naggi, A., Tarri, G., Cosami, A., dan Terbojevich, M. 1992. Structural Differences Between Chitin Polymorphs and Their Precipitates from Solution Evidences from CP-MAS 13 C-NMR, FTIR and FT-Raman Spectroscopy. *Carbohydrate Polymers* 17(2): 97-102.
- Franco, T.T., dan Peter, M.G. 2011. Advances in Chitin and Chitosan Research. *Polymer International* 60:873–874.
- Galed, G., Miralles, B., Panos, I., Santiago, A., dan Heras, A. 2005. N-Deacetylation and Depolymerization Reactions of Chitin/Chitosan: Influence of the Source of the Chitin. *Carbohydrate Polymers* 62:316-320.
- Gildberg, A., dan Stenberg, E. 2011. A New Process for Advanced Utilization of Shrimp Waste. *Process Biochemistry* 36:809–812.
- Gooday, G.W. 1977. Biosynthesis of the Fungal Wall: Mechanism and Implication. *Journal of General Microbiology* 99:1-11.
- Graham, L.S., dan Sticklen, M.B. 1994. Plant chitinases. *Canadian Journal of Botany* 72: 1057–1083.
- Haggag, W.M., dan Abdallh, E.G. 2012. Purification and Characterization of Chitinase Produced by Endophytic *Streptomyces hygroscopicus* Against Some Phytopathogens. *Journal of Microbiology Research* 2(5): 145-151.
- Hartl, L., Zach, S., dan Seidl-Seiboth, V. 2012. Fungal Chitinases: Diversity, Mechanistic Properties and Biotechnological Potential. *Applied Microbiology and Biotechnology* 93(2):533-543.
- Hernandez-Ledesma, B., dan Herrero, M. dalam Montilla, A., Ruiz-Matute, A.I., dan Corzo, N. 2014 “Bioactive Compounds from Marine Foods: Plant and Animal Sources”.

- Hirashi, A., Kamagata, Y., dan Nakamura, N. 1995. Polymerase Chain Reaction Amplification and Restriction Fragment Length Polymorphism Analysis of 16s rRNA Genes from Methanogens. *J. Ferment. Bioeng.* 79(6):523-529
- Homthong, M., Kubera, A., Srihuttagum, M., dan Hongtrakul, H. 2016. Isolation and Characterization of Chitinase from Soil Fungi, *Paecilomyces* sp. *Agriculture and Natural Resources* 50:232-242.
- Hossain, M.S., dan Iqbal, A. 2014. Production and characterization of chitosan from shrimp waste. *J. Bangladesh Agril. Univ.* 12(1): 153-160.
- Hukisson, E.C. 2008. Glucosamine and Chondroitin for Osteoarthritis. *The Journal of International Medicine Research* 36(6): 1-19.
- Hussain, M.R., Iman, M., dan Maji, T.K. 2013. Determination of Degree of Deacetylation of Chitosan and Their effect on the Release Behavior of Essential Oil from Chitosan and Chitosan-Gelatin Complex Microcapsules. *International Journal of Advanced Engineering Applications* 2(4): 4-12.
- Inokuma, K., Takano, M., dan Hoshino, K. 2013. Direct ethanol production from N-acetylglucosamine and Chitin Substrates by *Mucor* Species. *Biochemical Engineering Journal* 72:24-32.
- Islam, S.Z., Khan, M., dan Alam, A.K.M.N. 2016. Production of chitin and chitosan from shrimp shell wastes. *J. Bangladesh Agril. Univ.* 14(2): 253-259.
- Jabeen, F., dan Qazi, J.I. 2014. Isolation of Chitinase Yielding *Bacillus cereus* JF68 from Soil Employing an Edible Crab Shell Chitin. *Journal of Science and Industrial Research*. 73: 771-776.
- Jeyasanta, K.I., dan Patterson, J. 2015. Different types of formulated feeds on the biochemical composition of cultured shrimp, *Penaeus monodon* (Fabricius, 1798). *World J. Fish & Marine Sci.* 7(1): 55-68.
- Jenin, A., Babu, M.M., dan Murugan, M. 2015. Production and optimization of novel chitinase enzyme using *Aspergillus* species isolated from shells of infected *Artemia parthenogenetica*. *Int J. Res. Engineering and Bioscience* 3(1): 14-22.
- Je, J.Y., dan Kim, S.K. 2012. Chitosan as Potential Marine Nutraceutical. *Advances in Food and Nutrition Research* 65:121-135.
- Kasaai, Mohammad R. 2008. A review of several reported procedures to determine the degree of N-acetylation for chitin and chitosan using infrared spectroscopy. *Carbohydr Polym* 71:497–508.
- Kementerian Kelautan dan Perikanan (KKP). 2016. MEA Centre. Sektor Kelautan dan Perikanan.

- Khan, T.A., Peh, K.K., dan Ching, H.S. 2002. Reporting degree of deacetylation values of chitosan: the influence of analytical methods. *J Pharm Pharmaceut Sci* 5(3): 205-212.
- Khikmah, N., dan Septiana, D.H. 2016. Kemampuan kapang kitinolitik sebagai biolarvasida *Aedes aegypti*. Prosiding SEMIRATA Bidang MIPA: 2780-2784.
- Kim, S.K., dan Rajapakse, N. 2005. Enzymatic Production and Biological Activities of Chitosan Oligosaccharides (COS): A Review. *Carbohydrate Polymers* 62(4):357-368.
- Kumar, D.P., Singh, R.K., Anupama, P.D., Solanki, M.K., Kumar, S., Srivastava, A.K., Singhal, P.K., dan Arora, D.K. 2012. *Journal of Microbiology* 52(3):388-395
- Kumar, S., Stecher, G., dan Takamura, K. 2016. MEGA7: Molecular Evolutionary Genetics Analysis version 7.0 for bigger datasets. *Molecular Biology and Evolution* 33:1870-1874
- Ling, S.L.F., Yee, C.Y., dan Eng, H.S. 2011. Removal of a Cationic Dye Using Deacetylated Chitin (Chitosan). *Journal of Applied Sciences* 11(8):1445–1448.
- Lunge, A.G., dan Patil, A.S. 2012. Characterization of Efficient Chitinolytic Enzyme Producing *Trichoderma* Species: A Tool for Better Antagonistic Approach. *International Journal of Science, Environment* 1(5): 377-385
- Martati, E., Susanto, T., Yunianta, dan Ulifah, I.A. 2012. Isolasi khitin dari cangkang rajungan (*Portunus pelagicus*) kajian suhu dan waktu proses deproteinasi. *J. Tek. Pert.* 3(2): 129-137.
- Matsumoto, K.S. 2006. Fungal Chitinase: Advances in Agricultural and Food Biotechnology. 6:289-304.
- Minagawa, T., Okamura, Y., Shigemasa, Y., Minami, S., dan Okamoto, Y. 2007. Effects of Molecular Weight and Deacetylation Degree of Chitin/Chitosan on Wound Healing. *Carbohydrate Polymers* 67:640-644.
- Motoh, H. 1981. Studies on the Fisheries Biology of the Giant Prawn, *Penaeus monodon* in the Philippines. Southeast Asian Fisheries Development Center Technical Report 7:1-128.
- Muzzarelli, R.A.A. 1977. “Chitin”. Great Britain, Pergamon Press. hlm 46.
- Muzzarelli, R.A.A., Boudrant, J., Meyer, D., Manno, N., DeMarchis, M., dan Paoletti, M.G. 2012. Current Views on Fungal Chitin/Chitosan, Human Chitinases, Food Preservation, Glucans, Pectins and Inulin: a Tribute to Henri

- Braconnot, Precursor of the Carbohydrate Polymers Science, on the Chitin Bicentennial. *Carbohydrate Polymers* 87:995–1012
- Ngoan, L.D., Lindberg, J.E, Ogle, B., dan Thomke, S. 2000. Anatomical proportions and chemical and amino acid composition of common shrimp species in Central Vietnam. *Asian-Aust. J. Anim. Sci.* 13(10): 1422–1428.
- Okamoto, Y., Watanabe, M., Miyatake, K., Morimoto, M., Shigemasa, Y., dan Minami, S. 2002. Effects of Chitin/Chitosan and Their Oligomers/Monomers on Migrations of Fibroblasts and Vascular Endothelium. *Biomaterials* 23: 1975-1979.
- Paul, T., Halder, S. K., Das, A., Ghosh, K., Mandal, A., Payra, P., dan Mondal, K. C. 2015. Production of chitin and bioactive materials from Black tiger shrimp (*Penaeus monodon*) shell waste by the treatment of bacterial protease cocktail. *3 Biotech* 5(4): 483–493.
- Purwatiningsih. 1992. Isolasi Kitin dan Karakterisasi Komposisi Senyawa Kimia dari Limbah Kulit Udang Windu (*Penaeus monodon*). Skripsi. Jurusan Kimia Program Pasca Sarjana ITB. Bandung
- Qin, Y., Lu, X., Sun, N., dan Rogers, R.D. 2010. Dissolution or extraction of crustacean shells using ionic liquids to obtain high molecular weight purified chitin and direct production of chitin films and fibers. *Green Chem* 12: 968-971.
- Rifai, Dewi Nur Rizqiah. 2007. The Isolation and the Identification of Chitin, Chitosan from *Horshoe Crab* Shrimp Shell by Using Red Infra Spectroscopy.
- Robert, W.K., dan Selitrennikoff, C.P. 1988. Plant and Bacterial Chitinases Differ in Antifungal Activity. *Journal of General Microbiology*, 134: 169-176
- Rustad, T., dan Falch, E. 2002. Making the Most of Fish Catches. *Food Science and Technology* 16:36-37
- Saitou, N., dan Nei, M. 1987. The Neighbor-joining Method: A New Method for Reconstructing Phylogenetic Trees. *Molecular Biology and Evolution* (4):406-425
- Saleh M, Agustin TA, Suptijah P, Heruwati ES. 1999. Pembuatan Khitosan dari Kulit Udang Windu (*Penaeus monodon*) dan Uji Koagulasi Proteinnya. *JPPI* (3): 72-77.
- Schwarz, P., Bretagne, S., Gantier, J.C., Garcia-Hermoso, D., Lortholary, O., Dromer, F., dan Dannaoui, E. 2006. Molecular Identification of Zygomycetes from Culture and Experimentally Infected Tissues. *J. Clin. Microbiol* 44(2):340-349

- Seidl, V. 2008. Chitinases of Filamentous Fungi: A Large Group of Diverse Protein with Multiple Physiological Functions. *Fungal Biology Review* 22(1):36-42
- Setia, I.N., dan Suharjono. 2015. Chitinolytic Assay and Identification of Bacteria Isolated from Shrimp Waste Based on 16S rDNA Sequences. *Advances in Microbiology* 5:541-548
- Setnikar, I., Cereda, R., Pacini, M.A., dan Revel, L. 1991. Antireactive Properties of Glucosamine Sulfate. *Arzneimittelforschung* 41(2):157–161
- Shibata, Y., Honda, I., Justice, J.P., Van Scott, M.R., Nakamura, R.M., dan Myrvik, Q.N. 2001. Th1 Adjuvant N-acetyl-D-glucosamine Polymer Up-Regulates Th1 Immunity but Dwon-Regulates Th2 Immunity Against a Mycobacterial Protein (MPB-59) in Interleukin-10-Knockout and Wild-Mice. *Infection and Immunity* 69:6123-6130.
- Staton, J.L. 2015. Understanding Phylogenies: Constructing and Interpreting Phylogenetic trees. *Journal of the South Carolina Academy of Science* 13(1): 24-29.
- Struszczak, K., Szczesba-Antczak, M., Walczak, M., dan Antczak, T. Isolation and Purification of Intracellular Chitosanolytic Enzymes of *Mucor circinelloides*. *Progress on Chemistry and Application of Chitin and its Derivatives* 8:107-116.
- Suhardi.1993. Khitin dan khitosan. Pusat Antar Universitas Pangan dan Gizi. Universitas Gajah Mada, Yogyakarta.
- Suyanto, S.R., dan Takarina, E.P. “Panduan Budidaya Udang Windu”. 2009. Penebar Swadaya, Depok. hlm 13-16.
- Terbojevich, M. dan Muzzarelli, R.A.A. dalam Phillips, G.O. dan Williams, P.A. 2000. *Handbook of Hydrocolloids*. Cambridge, Uk. Woodhead Publishing. Hlm 367-378.
- The International Union of Biochemistry and Molecular Biology (IUBMB). 1992. Enzyme Nomenclature Recommendation. EC 3.2.1. Diambil dari: <http://www.chem.qmul.ac.uk/iubmb/enzyme/EC3/2/1/>. Diakses pada tanggal 5 Juli 2017.
- Toews, Victoria Dolby. Glucosamine & Chondroitin., dalam Challe, J. 2003. “User’s Guide to Nutritional Supplements”. USA, Basic Health Publications. hlm 153-174.
- Varun, T.K., Senani, S., Jayapal, N., Chikkerur, J., Roy, S., Tekulapally, V.B., Gautam, M., dan Kumar, N. 2017. Extraction of chitosan and its oligomers from shrimp shell waste, their characterization and antimicrobial effect. *Vet World* 10(2): 170-175.

- Venugopal, Vazhiyil. 2009. "Marine Products for Healthcare: Functional and Bioactive Nutraceutical Compounds from the Ocean". Boca Raton, CRC Press. hlm 185-209.
- Venugopal, Vazhiyil. 2011. "Marine Polysaccharides: Food Applications". Boca Raton, CRC Press. hlm 68-69.
- Wakida-Kusunoki, A.T., Anda-Fuentes, D.D, dan Lopez-Tellez, N.A. 2016. Presence of Giant Tiger Shrimp *Penaeus monodon* (Fabricius, 1798) in Eastern Peninsula of Yucatan Coast, Mexico. Latin American Journal of Aquatic Research 44(1): 155-158.
- White, T.J., Bruns, T., Lee, S., dan Taylor, J.W., 1990. Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics., dalam: Innis, M.A., Gelfand, D.H., Sninsky, J.J., White, T.J. (Eds.). "PCR Protocols: a Guide to Methods and Applications". New York, Academic Press. hlm 315-322.
- Wongjirathiti, A., dan Yottakot, S. 2017. Utilisation of Local Crops as Alternative Media for Fungal Growth. Pertanika J. Trop. Agric. Sci. 40(2):296-304.
- Yen, L.T.H, Tuan, N.A., Hung, L.V., Nhung, N.T.H., dan Hop, D.V. 2010. Screening for Chitinolytic Fungi Isolated in Vietnam and Optimizing Cultural Conditions for the Production of Chitinase by *Trichoderma reesei* VN09-F0060. ICBiotech Annual Report Journal Osaka University, Japan. 449-459.
- Yong, T., Hong, J., Zhangfu, L., Li, Z., Xiuqiong, D., Ke, T., Shaorong, G., dan Shigui, L. 2005. Purification and Characterization of an Extracellular Chitinase Produced by Bacterium C4. Annals of Microbiology 55(3):213-218.
- Younes, I., dan Rinaudo. 2015. Chitin and Chitosan Preparation from Marine Sources. Structure, Properties and Application. Mar. Drugs 13:1133-1174.