

## DAFTAR PUSTAKA

- Abdelmajeed, N. A., Khelil, O. A., dan Danial, E. N. 2012. Immobilization technology for enhancing bio-products industry. *African Journal of Biotechnology* 11(71): 13528-13539.
- Adinarayana, K., Jyothi, B., dan Ellaiah, P. 2005. Production of Alkaline Protease with Immobilized Cells of *Bacillus subtilis* PE-11 in Various Matrices by Entrapment Techniques. *AAPS PharmSciTech* 6(3): 391-397.
- Agustina, S., Swantara, I. M. D., dan Suartha, I. N. 2015. Isolasi kitin, karakterisasi, dan sintesis kitosan dari kulit udang. *Jurnal Kimia* 9(2): 271-278.
- Ali, S. S. R., Ramachandran, M., Chakma, S. K., dan Sheriff, M. A. 2017. Proximate composition of commercially important marine fishes and shrimps from the Chennai coast, India. *International Journal of Fisheries and International Studies* 5(5): 113-119.
- Anderson, J.W., R.J. Nicolosi, dan J.F. Borzelleca. 2005. Glucosamine effects in humans: A review of effects on glucose metabolism, side effects, safety considerations and efficacy. *Food and Chemical Toxicology* 43: 187-201.
- Animal Diversity Web (ADW). 2014. *Penaeus monodon*. Available from [https://animaldiversity.org/accounts/Penaeus\\_monodon/pictures/collections/contributors/Grzimek\\_inverts/Decapoda/Penaeus\\_monodon/](https://animaldiversity.org/accounts/Penaeus_monodon/pictures/collections/contributors/Grzimek_inverts/Decapoda/Penaeus_monodon/). Accessed 2018 July 14.
- AOAC. 2005. "Official Methods of Analysis." Association of Official Analytical Chemist, Washington D.C.
- Arizandy, R. Y. 2012. Pemurnian parsial lakase dari isolat kapang tandan kosong kelapa sawit dan uji aktivitasnya terhadap substrat alam. Skripsi, Universitas Airlangga, Surabaya.
- Badan Pusat Statistik (BPS). 2014. Statistik hasil perikanan menurut komoditi, provinsi, dan pelabuhan asal ekspor. Jakarta: Badan Pusat Statistik.
- Badan Standarisasi Nasional (BSN). 2013. SNI 7948:2013. "Kitin: Syarat Mutu dan Pengolahan." Badan Standarisasi Nasional, Jakarta.
- Beier, S. dan Bertilsson, S. 2013. Bacterial chitin degradation-mechanisms and ecophysiological strategies. *Front Microbial* 4(149): 1-12.
- Benavente, M., Arias, S., Moreno, L., dan Martinez, J. 2015. Production of glucosamine hydrochloride from crustacean shell. *Journal of Pharmacy and Pharmacology* 3: 20-26.
- Bisht, D., Yadav, S. K., dan Darmwal, N. S. 2012. Optimization of immobilization conditions by conventional and statistical strategies for alkaline lipase production by *Pseudomonas aeruginosa* mutant cells: Scale-up at Bench-scale Bioreactor Level. *Turk J Biol* 37: 392-404.

- CABI. 2018. *Penaeus monodon* (Giant Tiger Prawn). Available from <https://www.cabi.org/isc/datasheet/71093>. Accessed 2018 July 14.
- Cahyaningrum, S. E. 2014. Studi peranan ion logam pada proses immobilisasi enzim papain. Seminar Nasional Kimia dan Pendidikan Kimia VI: 194-204.
- Cheba, B. A. 2011. Chitin and chitosan: marine biopolymers with unique Properties and versatile applications. *Journal of Biotechnology and Biochemistry* 6(3): 149-153.
- Cheba, B. A., Zaghloul, T. I., El-Mahdy, A. R., dan El-Massry, M. H. 2011. Enhanced production of *Bacillus* sp. R2 chitinase through cell immobilization. *ACT-Biotechnology Research Communications* 1(1): 8-13.
- Chen, J. K., Shen, C. R., Yeh, C. H., Fang, B. S., Huang, T. L., dan Liu, C. L. 2011. N-acetyl-glucosamine obtained from chitin by chitin degrading factors in *chitinbacter tainanesis*. *International Journal of Molecular Sciences* 12(2): 1187-1195.
- Christy, A. 2018. Optimum conditions for N-acetyl glucosamine production from *Penaeus monodon* shrimp shells by solid fermentation using *Trichoderma virens*. Skripsi, Universitas Pelita Harapan, Tangerang.
- Darmawan, R., Widjaja, T., Mulyanto, dan Ardiansyah, E. T. 2010. Studi perbandingan produksi etanol secara kontinyu menggunakan *Z. mobilis* termutasi teknik tmmobilisasi sel: Ca-alginat dan  $\kappa$ -karagenan. *Seminar Rekayasa Kimia dan Proses*: 1-6.
- Devi, D. A. dan Lakshmi, V. V. 2014. Prolonging the utilization of keratinase by entrapment of cells. *International Journal of Current Microbiology and Applied Sciences* 3(8): 38-44.
- Dompeipen, E. J. 2017. Isolasi dan identifikasi kitin dan kitosan dari kulit udang windu (*Penaeus monodon*) dengan spektroskopi inframerah. *Majalah BIAM* 13(1): 31-41.
- Dompeipen, E. J., Kaimudin, M., dan Dewa, R. P. 2016. Isolasi kitin dan kitosan dari limbah kulit udang. *Majalah BIAM* 12(1): 32-38.
- Du, L., Brenner, T., Xie, J., Liu, Z., Wang, S., Matsukawa, S. 2016. Gelation of iota/kappa carrageenan mixtures. 1-8.
- Duarte, J. C., Rodrigues, J. A. R., Moran, P. J. S., Valenca, G. P., dan Nunhez, J. R. 2013. Effect of immobilized cells in calcium alginate beads in alcoholic fermentation. *AMB Express* 3(31): 1-8.
- Dutta, P. K., Dutta, J., dan Tripathi, V. S. 2004. Chitin and chitosan: Chemistry, properties and applications. *Journal of Scientific & Industrial Research* 63: 20-31.
- Elakkiya, M., Prabhakaran, D., dan Thirumarimurugan, M. 2016. Methods of cell immobilization and its applications. *IJRSET* 5(4): 5429-5433.

- Ellaiah, P., Prabhakar, T., Ramakrishna, B., Taleb, A. T., dan Adinarayana, K. 2001. Production of lipase by immobilized cells of *Aspergillus niger*. *Process Biochemistry* 39:525-528.
- Erjanan, S., Dotulong, V., dan Montolalu, R. 2017. Mutu karaginan dan kekuatan gel dari rumput laut merah *Kappaphycus alvarezii*. *Jurnal Media Teknologi Hasil Perikanan* 5(2): 130-133.
- Fabiola. 2018. Optimasi pembuatan N-asetilglukosamin dari limbah padat udang (*Penaeus monodon*) dengan bantuan kapang *Beauveria bassiana*. Skripsi, Universitas Pelita Harapan, Tangerang.
- Food Agriculture Organization of the United Nations (FAO). 2018. Black Tiger Shrimp – *Penaeus monodon*. Available from <http://www.fao.org/fishery/affris/species-profiles/giant-tiger-prawn/giant-tiger-prawn-home/en/>. Accessed 2018 July 14.
- Gladson, B. 2011. "Pharmacology for Rehabilitation Professionals." Elsevier, Missouri.
- Halim, Y., Hardoko, Handayani, R., dan Lucida, V. 2018. Optimum conditions for N-acetyl glucosamine production from tiger shrimp (*Penaeus monodon*) shell by *Serratia marcescens*. *Asian Journal of Pharmaceutical and Clinical Research* 11(12): 488-493.
- Herdyastuti, N., Raharjo, T.J., Mudasir dan Matsjeh, S. 2009. Chitinase and chitinolytic microorganism: Isolation, characterization and potential. *Journal Chemistry* 9 (1): 37-47.
- Hossain, M.S. dan Iqbal, A. 2014. Production and characterization of chitosan from shrimp waste. *J. Bangladesh Agril. Univ.* 12(10): 153-160.
- Ibrahim, H. M., Salama, M. F., dan El-Banna, H. A. 1999. Shrimp's waste: Chemical composition, nutritional value and utilization. *Nahrung/Food* 43(6): 418-423.
- Ihsani, S. L. dan Widyastuti, C. R. 2015. Sintesis biokoagulan berbasis kitosan dari kulit udang untuk pengolahan air sungai yang tercemar limbah industri jamu dengan kandungan padatan tersuspensi tinggi. *JBAT* 4(2): 66-70.
- Isa, M. T., Ameh, A. O., Gabriel, J. O., dan Adama, K. K. 2012. Extraction and characterization of chitin from Nigerian sources. *Leonardo Electronic Journal of Practices and Technologies* 21: 73-81.
- 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.
- Kardiman, C. 2013. Manfaat glukosamin, kondroitin, dan metilsulfonilmetana pada osteoarthritis. *CDK* 40 (12): 936-939.
- Kementerian Kelautan dan Perikanan (KKP). 2017. Udang Vaname dan Udang Windu Masih Andalan Ekspor Indonesia. Available from

[http://www.djpb.kkp.go.id/arsip/c/246/Udang-Vaname-dan-Udang-Windu-Masih-Andalan-Ekspor-Indonesia/?category\\_id=13](http://www.djpb.kkp.go.id/arsip/c/246/Udang-Vaname-dan-Udang-Windu-Masih-Andalan-Ekspor-Indonesia/?category_id=13). Accessed 2018 July 12.

- Khan, Z. U., Ahmad, S., Brazda, A., dan Chandy, R. 2009. *Mucor circinelloides* as a cause of invasive maxillofacial zygomycosis: an emerging dimorphic pathogen with reduced susceptibility to posaconazole. *Journal of Clinical Microbiology* 47(4): 1244-1248.
- Khetan, S. K. 2001. "Microbial Pest Control." Marcel Dekker, New York.
- Kim, S. W. 2011. "Chitin, Chitosan, Oligosaccharides and Their Derivatives: Biological Activities and Applications." CRC Press, Boca Raton.
- Kralovec, J.A., dan Barrow, C.J. 2008. "Marine Nutraceuticals and Functional Foods." CRC Press, New York.
- Kurniasih, M. dan Dwiasi, D. W. 2007. Preparasi dan karakterisasi kitin dari kulit udang putih (*Litopenaeus vannamei*). *Molekul* 2(2): 79-87.
- Li, C.H., C., Maria, S., Deborah J., B., Teun, V., Rosa M. R., M., Santiago R. T., H., Joseph, dan L., Soo C. 2011. Sporangiospore size dimorphism is linked to virulence of *Mucor circinelloides*. *PLoS Pathog* 7(6).
- Lim, S. M., Song, D. K., Cho, K. J., Oh, S. H., Lee-Yoon, D. S., Bae, E. H., dan Lee, J. H. 2007. Cell adhesion and degradation behavior of acetylated chitosan film. *IFMBE Proceedings* 15: 94-97.
- Machado, I., Teixeira, J. A., dan Couto, S. R. 2013. Semi-solid-state fermentation: A promising alternative for neomycin production by the actinomycete *Streptomyces fradiae*. *Journal of Biotechnology* 165: 195-200.
- Mahyudin, A. R., Yuliandri, R., dan Syaawalz, A. 2011. Isolasi dan karakterisasi kitin dari limbah udang. *Jurnal Sains Natural Universitas Nusa Bangsa* 1(2): 166-178.
- Martati, E., Susanto, T., Yuniarta, dan Ulifah, E. A. 2002. Isolasi khitin dari cangkang rajungan (*Portunus pelagicus*): Kajian suhu dan waktu proses deproteinasi. *J. Tek. Pert.* 3(2): 129-137.
- Martinez, A. M., Vivas, G. J., dan Quicazan, M. C. 2016. Evaluation of alcoholic fermentation during the production of mead using immobilized cells in kappa-carrageenan. *Chemical Engineering Transactions* 49: 19-24.
- Martins, S. C. S., M., Claudia M., F., Larissa M. C. G., dan S., Sandra T. 2013. Immobilization of microbial cells: A promising tool for treatment of toxic pollutants in industrial wastewater. *Academic Journals* 12(28): 4412-4418.
- Maud, P. J. dan Foster, C. 2006. "Physiological Assesment of Human Fitness" 2<sup>nd</sup> ed. *Human Kinetics*, Illinois, hal 164.
- McLaughlin, D. J., McLaughlin, E. G., dan Lemke, P. A. 2001. "The Mycota: A Comprehensive Treatise on Fungi as Experimental Systems for Basic and Applied Research." 7<sup>th</sup> ed. Springer-Verlag, Heidelberg, hal 150.

- Mesla, W., Mahdi, C., dan Sutrisno. 2014. Optimasi amobilisasi xilanase dari *Trichoderma viride* menggunakan matriks Ca-alginat-kitosan. *Student Journal* 2(1): 428-434.
- Nadia, L. M. H., P., Suptijah, dan B., Ibrahim. 2014. Produksi dan karakterisasi nano kitosan dari cangkang udang windu dengan metode gelas ionik. *JPHPI* 17(2): 119-126.
- Nasichah, A. Z., Hastuti, U. S., Suarsini, E., dan Rohman F. 2016. Identifikasi morfologi kapang endofit cengkeh afo dari ternate. *Proceeding Biology Education Conference* 13(1): 787-792.
- National Center for Biotechnology Information (NCBI). 2018. *Mucor circinelloides*. Available from <https://www.ncbi.nlm.nih.gov/genome/?term=Mucor+circinelloides+f.+c+ircinelloides>. Access 2018 July 12.
- Nduru, F. M. A., Drastinawati, dan Yenti, S. R. 2018. Isolasi kitin dari limbah cangkang kepiting (*Scylla* sp.) dengan variasi pelarut pada proses bleaching. *Jom FTEKNIK* 5(1): 1-6.
- 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-Australasian Journal of Animal Sciences* 13(10): 1422-1428.
- Nielsen, S. S. 2010. "Food Analysis" 4<sup>th</sup> ed. Springer Science+Business Media. New York, hal 578-582.
- Nielsen, S. S. 2017. "Food Analysis Laboratory Manual" 3<sup>rd</sup> ed. Springer Science+Business Media. New York, hal 132-134.
- Nurjannah, Alfiana, Darmanto, dan Wijayanti, I. 2016. Optimasi pembuatan glukosamin hidroklorida (GLcN HCl) dari limbah cangkang rajungan melalui hidrolisis kimiawi. *JPHPI* 19(1): 26-35.
- Paul, T., Halder, S. K., Das, A., Ghosh, K., Mandal, A., Payra, P., Barman, P., Mohapatra, P. K. D., Pati, B. R., 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. *Journal of 3Biotech* 5(4): 483-493.
- Prashanth, K.V.H., dan R.N. Tharanathan. 2007. Chitin/chitosan: modifications and their unlimited application potential an overview. *Journal Trends in Food Science and Technology* 18 (1): 117-131.
- Pratiwi, R. S., Susanto, T. E., Wardani, Y. A. K., dan Sutrisno, A. 2015. Enzim kitinase dan aplikasi di bidang industri: Kajian Pustaka. *Jurnal Pangan dan Agroindustri* 3(3): 878-887.
- Rahmansyah, M. dan Sudiana, I. M. 2013. Status aktivitas  $\beta$ -amilase dan pola fosfomonoesterase isolat mikrobial tanah dari hutan bukit bangkirai. *BioSmart* 6(1): 6-9.

- Ratnasari, N., Kusumawati, N., dan Kuswardani, I. 2014. Pengaruh konsentrasi natrium alginat sebagai penjerat sel *Lactobacillus acidophilus* FNCC 0051 dan lama penyimpanan terhadap jumlah sel yang terlepas dan karakter *carrier*. *Jurnal Teknologi Pangan dan Gizi* 13(2): 81-86.
- Ravichandran, S. Rameshkumar G., dan Prince AR. 2009. Biochemical composition of shell and flesh of the indian white shrimp (*Penaeus indicus*). *Journal of Scientific Research* 4(3): 191-194.
- Ravinder, K., Prabhakar, T., Prasanthkumar, K., dan Venuka, N. 2012. Immobilization of Cyclodeextrin Glycosyltransferase from Newly Isolated, Mutated *Bacillus* sp. TPR71HNA6 by Entrapment Technique. *Advances in Applied Science Research* 3(4): 2288-2298.
- Rodde, R. H., Einbu, A., dan Varum, K. M. A seasonal study of the chemical composition and chitin quality of shrimp shells obtained from northern shrimp (*Pandalus borealis*). *Journal of Carbohydrate Polymers* 71(3): 388-393.
- Sandai, D., Ibrahim, D., dan Kassim, J. 2012. Calcium alginate entrapped cells of *Penicillium digitatum* FETL DS1 for the improvement of tannase production. *BTAIJ* 6(2): 27-34.
- Sankaralingam, S., Harinathan, B., Kathiresan, D., Palavesam, A., dan Nawas, P. M. A. 2016. Cell immobilization of *Bacillus flexus* for the production of moderately extracellular protease. *International Journal of Innovations in Agricultural Sciences* 1(1): 23-36.
- Sanusi, M. 2004. Transformasi kitin dari hasil isolasi limbah industri udang beku menjadi kitosan. *Mar. Chim Acta* 5(2): 28-32.
- Saparianti, E. 2001. Amobilisasi sel *Pediococcus acidilactici* F11 penghasil bakteriosin pada gel kalsium alginat. *Jurnal Teknologi Pertanian* 2(1): 1-9.
- Setty, R.S dan V. Sreekrishna. 2007. "Biotechnology-2: Including Cell Biology, Genetics, Microbiology." New Age International Publishers, New Delhi.
- Sitanggang, A.B., Sophia L., dan Wu H.S. 2012. Mini Review: Aspects of glucosamine production using microorganisms. *International Food Research Journal* 19(2): 393-404.
- Sizer, F. S. dan Whitney, E. 2012. "Nutritions: Concepts & Controversies." Wadsworth Cengage Learning, hal 208.
- Stolarzewicz, L., E. Bialecka-Florjańczyk, E. Majewska, dan J. Krzyczkowska. 2011. Immobilization of yeast on polymeric supports. *Chem. Biochem. Eng. Q* 25(1): 135-144.
- Subramaniam, R. dan R. Vimala. Solid state and submerged fermentation for the production of bioactive substances: A comparative study. *IJSN* 3(3): 480-486.

- Suryadi, H., Radji, M., dan Respati, E. A. 2007. Isolasi dan skrining kapang potensial penghasil monakolin K.
- Suyanto, S. R. dan Mujiman, A. 2004. "Budidaya Udang Windu." Penebar Swadaya, Jakarta, hal 35-45.
- Tanjung, E., Roosdiana, A., dan Mardiana, D. 2013. Amobilisasi pektinase hasil isolasi dari *Aspergillus niger* menggunakan matriks karagenan. *Kimia Student Journal* 2(1): 449-455.
- Teja, E. 2018. Optimasi produksi N-asetilglukosamin dari kulit udang windu menggunakan enzim kitinase intraseluler semi murni *Providencia stuartii*. Skripsi, Universitas Pelita Harapan, Tangerang.
- Thantsha, M.S. 2007. Cell immobilization techniques for the preservation of probiotics. Thesis, University of Pretoria, South Africa.
- Vásquez, J. A., Ramoz, P., Mirón, J., Valcarcel, J., Sotelo, C. G., dan Martín, R. L. P. 2017. Production of chitin from *Panaeus vannamei* by-products to pilot plant scale using a combination of enzymatic and chemical processes and subsequent optimization of the chemical production of chitosan by response surface methodology. *Marine Drugs* 15:1-14.
- Veronica. 2018. Isolasi dan identifikasi kapang penghidrolisis kitin yang diisolasi dari kulit udang windu (*Panaeus monodon*). Skripsi, Universitas Pelita Harapan, Tangerang.
- Wahyuni, Ridhay, A., dan Nurakhirawati. 2016. Pengaruh waktu proses deasetilasi kitin dari cangkang bekicot (*Achatina fulica*) terhadap derajat deasetilasi. *Kovalen* 2(1): 1-7.
- Waltam, D. R. 2009. Demineralisasi dan deproteinasi kulit udang secara kontinyu pada tahapan ekstraksi kitin secara biologis. Skripsi, Universitas Indonesia, Depok.
- Yanti, D. I. W. dan Dali, F. A. 2013. Karakterisasi bakteri asam laktat yang diisolasi selama fermentasi bakasang. *JPHPI* 16(2): 133-141.
- Zhang, P., Zhou, W., Wang, P., Wang, L., dan Tang, M. 2012. Enhancement of chitosanase production by cell immobilization of *Gongronella* sp. *JG. Brazilian Journal of Microbiology*.
- Ziaee, A., M. Zia, M. Bayat, dan J. Hashemi. 2016. Identification of *Mucorales* isolates from soil using morphological and molecular method. *Curr Med Mycol* 2(1): 13-19.