

บรรณานุกรม

- เขมรัฐ เขมวงศ์. (2550). การคัดเลือกและสภาวะที่เหมาะสมต่อการผลิต โคพอลิเมอร์จากแบคทีเรียสังเคราะห์แสงทนเค็มสายพันธุ์กลาย. วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต, สาขาวิชาเทคโนโลยีชีวภาพ, คณะอุตสาหกรรมเกษตร, มหาวิทยาลัยสงขลานครินทร์.
- ดาวรุ่ง กังวานพงศ์. (2549). พันธุศาสตร์ (พิมพ์ครั้งที่ 2). เชียงใหม่: ภาควิชาชีววิทยา, คณะวิทยาศาสตร์, มหาวิทยาลัยเชียงใหม่. 518 หน้า.
- ธนาวิถึ ถีจากภย์. (2551). พลาสติกย่อยสลายได้ : อดีต ปัจจุบัน อนาคต. เข้าถึงได้จาก <http://www.vcharkarn.com>.
- ธงชัย วงศ์สุวรรณ. (2550). การผลิตพอลิไฮดรอกซีอัลคาโนเอตโดยใช้กรดคาร์บอกซิลิกที่ได้จากการหมักเส้นใยปาล์ม. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาวิชาเทคโนโลยีชีวภาพ, คณะอุตสาหกรรมเกษตร, มหาวิทยาลัยสงขลานครินทร์.
- ผกาดี นารอง. (2542). พลาสติกที่สามารถย่อยสลายได้. วิศวกรรมสาร ม.ช., 4, 45-53.
- พรเทพ ถนนแก้ว และตรีตาภรณ์ จันทน์เทศ. (2553). พอลิไฮดรอกซีบิวทีเรต: พลาสติกชีวภาพที่สามารถย่อยสลายได้ง่าย. วารสารศูนย์บริการวิชาการ, 18(1), 27-30.
- เศรษฐวัชร ฉ่ำศาสตร์. (2551). เอกสารคำสอนวิศวกรรมกระบวนการทางชีวภาพ. ชลบุรี: ภาควิชาชีววิทยา, คณะวิทยาศาสตร์, มหาวิทยาลัยบูรพา.
- สาโรจน์ ศิริสันตนิยกุล. (2547). เทคโนโลยีชีวภาพอาหาร การหมักและสิ่งแวดล้อม. กรุงเทพฯ : ภาควิชาเทคโนโลยีชีวภาพ, มหาวิทยาลัยเกษตรศาสตร์.
- สิรินุช ลามศรีจันทร์. (2540). การกลายพันธุ์ของพืช. กรุงเทพฯ : ภาควิชารังสีประยุกต์และไอโซโทป มหาวิทยาลัยเกษตรศาสตร์. 205 หน้า.
- อรุณี วงศ์ปิยะสกลิตย์. (2550). การกลายพันธุ์ : เพื่อการปรับปรุงพันธุ์พืช. กรุงเทพฯ : ภาควิชารังสีประยุกต์และไอโซโทป มหาวิทยาลัยเกษตรศาสตร์. 279 หน้า.
- Anderson, A. J., & Dawes, E. A. (1990). Occurrence, metabolism, metabolic role, and industrial uses of bacterial polyhydroxyalkanoates. *Microbiology Review*, 54, 450-472.
- Chaijamrus, S., & Uduay, N. (2008). Production and characterization of polyhydroxybutyrate from molasses and corn steep liquor produced by *Bacillus megaterium* ATCC6748. *Agricultural Engineering International*, Proceeding, Naresuan University, 1-12.
- Chamsart, S., Sawanwon, C., Thungkao, S., & Waiprib, Y. (2006). Enzymatic hydrolysis of cassava starch in a stirred tank lysis reactor. In *Proceeding of 15th Thai Chemical In*

Proceeding of 15th Thai Chemical Engineering and Applied Chemistry Conference :
October 27-28, 2005. Jomtien Palm Beach Hotel & resort : Chonburi.

- Choi, J., & Lee, S. Y. (1997). Process analysis and economic evaluation for Poly (3-hydroxybutyrate) production by fermentation. *Bioprocess and Biosystems Engineering*, 17, 335-342.
- Chomchai, S., & Chongcharoen, R. (2012). Effect of carbon and nitrogen sources on growth and polyhydroxybutyrate production by *Alcaligenes latus* ATCC 29714. In *Proceeding of 50th Kasetsart University Annual Conference: Natural Resources and Environment, February 1-2, 2012.* (pp. 32-39).
- Divyashree, M. S., & Shamala, T. R. (2009). Effect of gamma irradiation on cell lysis and polyhydroxyalkanoate produced by *Bacillus flexus*. *Radiation Physics and Chemistry*, 78, 147-152.
- DSMZ catalogue. (1993). *Deutsche Stammsammlung für Mikroorganismen und Zellkulturen GmbH (German Culture Collection of Microorganisms and Cell Cultures)* (5th ed.).
- El-sayed, Azhar, A., Abdelhady, H. M., Abdel, A. M., & Khodair, T. A. (2009). Batch production of polyhydroxybutyrate (PHB) by *Ralstonia eutropha* and *Alcaligenes latus* using bioreactor different culture strategies. *Journal of Applied Science Research*, 5(5), 556-564.
- Fatemeh, T., & Ebrahim, V. F. (2002). Biosynthesis of Poly- β -hydroxybutyrate as a biodegradable polymer. *Iranian Polymer Journal*, 12, 37-42.
- Flechter, A. (1993). In : *plastics from bacteria and for bacteria : PHA as natural, biodegradable polyesters*. New York : Springer Verlag.
- Gahlawat, G., & Srivastava, A. K. (2013). Development of a mathematical model for the growth associated polyhydroxybutyrate fermentation by *Azohydromonas australica* and its use for the design of fed-batch cultivation strategies. *Bioresource Technology*, 137, 98-105.
- Ganzeveld, K. J., Hagen, A. V., Agteren, M. H. V., Koning, W. D., & Uiterkamp, A. J. M. S. (1999) Upgrading of organic waste: production of the copolymer poly-3-hydroxybutyrate-co-valerate by *Ralstonia eutrophus* with organic wastes sole carbon source. *Journal of Cleaner Production*, 7, 413-419.

- Grothe, E., Young, M. M., & Chisti, Y. (1999). Fermentation optimization for the production of Poly (β -hydroxybutyric acid) microbial thermoplastic. *Enzyme and Microbial Technology*, 25, 132-141.
- Hikmet, K., Belma, A., Zehra, N. Y., Nazime, M., & Yavuz, B. (2003). Production of poly- β -hydroxybutyrate (PHB) and differentiation of putative *Bacillus* mutant strains by SDS-PAGE of total cell protein. *African Journal of Biotechnology*, 2(6), 147-149.
- Holmes, P. A. (1985). Applications of PHB—A microbially produced biodegradable thermoplastic. *Physics in Technology*, 16, 32-36.
- Jacquel, N., Chi, W. L., Yu, H. W., Ho, S. W., & Shaw, S. W. (2008). Isolation and purification of bacterial poly (3-hydroxyalkanoates). *Biochemical Engineering Journal*, 39, 15-27.
- Jiang, Y., Song, X., Gong, L., Li, P., Dai, C., & Shao, W. (2008). High poly (β -hydroxybutyrate) production by *Pseudomonas fluorescens* A2a5 from inexpensive substrates. *Enzyme and Microbial Technology*, 42, 167-172.
- Jogdand, S. N. (2004). *Welcome to the Eco-Friendly Plastic (online)*. Retrieved from <http://www.biotechsupportindae.com/jogsn/.html>.
- Johnstone, B. (1990). A throw away answer. *Far Eastern Economic Review*, 147, 62-63.
- Jung, Y. M., Park, J. S., & Lee, Y. H. (2000). Metabolic engineering of *Alcaligenes eutrophus* through the transformation of cloned phbCAB genes for the investigation of the regulatory mechanism of polyhydroxyalkanoate biosynthesis. *Enzyme and Microbial Technology*, 26, 201-208.
- Kaewjan, K., Palakas, S., Pattanasupong, A., & Ratanaphadit., K. (2011). Polyhydroxybutyrate (PHB) production by *Alcaligenes latus* TISTR 1403 treated with gamma radiation and 2-aminoanthracene. In *Proceeding of 49th Kasetsart University Annual Conference: Natural Resources and Environment, February 1-4, 2011*. (pp. 193-201).
- Kecskemeti, G., Smausz, T., Kresz, N., Toth, Zs., Hopp, B., Chrisey, D., & Berkesi, O. (2006). Pulsed laser deposition of polyhydroxybutyrate biodegradable polymer thin films using ArF excimer laser. *Applied Surface Science*, 253, 1185-1189.
- Khanafari, A., Akhavan, S. A., & Mogharab, M. (2006). Production and recovery of poly- β -hydroxybutyrate from whey degradation by *Azotobacter*. *Environment Health Science Engineering*, 3, 193-198.

- Khanna, S., & Srivastana, A. K. (2005). Statistical media optimization studies for growth and PHB production by *Ralstonia eutrophus*. *Process Biochemistry*, 40, 2173-2182.
- Khanna, S., & Srivastana, A. K. (2006). Optimization of nutrient feed concentration and addition time for production of poly (β -hydroxybutyrate). *Enzyme and Microbial Technology*, 39, 1145-1151.
- Kim, J. S., Lee, B. H., & Kim, B. S. (2005). Production of poly(3-hydroxybutyrate-co-4-hydroxybutyrate) by *Ralstonia eutropha*. *Biochemistry Engineering Journal*, 23, 169-174.
- Kinoshita, S., Kulprecha, K., & Chao, A. (1991). Microbial Production of Poly- β -Hydroxybutyric Acid. In Y. Oshima (Ed.), *Annual Report of IC Biotech* (pp. 347-349). Osaka : Osaka University.
- Kumar, M. S., Mudliar, S. N., Reddy, K. M., & Chakrabarti, T. (2004). Production of biodegradable plastics from activated sludge generated from a food processing industrial wastewater treatment plant. *Bioresource Technology*, 95, 327-330.
- Kulprecha, S., Boonruangthavorn, A., Meksiriporn, B., & Thongchul, N. (2009). Inexpensive fed-batch cultivation for high poly(3-hydroxybutyrate) production by a new isolate of *Bacillus megaterium*. *Journal of Bioscience and Bioengineering*, 107, 240-245.
- Leda, R. C., David, A. M., & Denise, M. G. F. (2009). Production of polyhydroxyalkanoates (PHAs) from waste materials and by-products by submerged and solid-state fermentation. *Bioresource Technology*, 100, 5996-6009.
- Li, Z. J., Shi, Z. Y., Jian, J., Guo, Y. Y., Wu, Q., & Chen, G. Q. (2010). Production of poly (3-hydroxybutyrate-co-4-hydroxybutyrate) from unrelated carbon sources by metabolically engineered *Escherichia coli*. *Metabolic Engineering*, 12, 352-359.
- Luengo, J. M., García, B., Sandoval, A., Naharro, G., & Olivera, E. R. (2003). Bioplastics from microorganisms. *Current Opinion Microbiology*, 6(3), 251-260.
- Luli, G. W., & Strohl, W. R. (1990). Comparison of growth acetate production and acetate inhibition of *Escherichia coli* strains in batch and fed-batch fermentations. *Applied and Environmental Microbiology*, 56, 1004-1011.
- Madison, L. L., & Huisman, G. W. (1999). Metabolic engineering of poly- β -hydroxyalkanoates from DNA to plastic. *Microbial Molecular Biology Reviews*, 63, 21-53.

- Mercan, N., Aslim, B., Yuksekdağ, Z. N., & Beyatlı, Y. (2002). Production of poly- β -hydroxybutyrate (PHB) by some *Rhizobium* bacteria. *Turkish Journal of Biology*, 26, 215-219.
- Miller, G. L. (1959). Use of dinitrosalicylic acid reagent for determination of reducing sugar. *Analytical Chemistry*, 31(3), 426-428.
- Mona, K. G., Azza, E. S., & Sanaa, H. O. (2001). Production of PHB by *Bacillus megaterium* strain using sugarcane molasses and corn steep liquor as carbon and nitrogen source. *Microbiological Research*, 156, 201-207.
- Montaser, N., Ardjmand, M., Heidari, N. A., & Safe, K. A. (2011). Optimization of microbial culture for production of polyhydroxybutyrate (PHB) by *Azotobacter Beijerinckii* DSMZ-1041. *World Applied Sciences Journal*, 14, 72-82.
- Nath, A., Dexit, M., Bandiya, A., Chavda, S., & Desai, A. J. (2008). Enhance PHB production and scale-up studies using cheese whey in fed-batch culture of *Methylobacterium* sp. ZP24. *Bioresource Technology*, 99, 5749-5755.
- Nunoy, P., Tuntiwaranuruk, C., Noparatarpakul, J., & Meepool, A. (2011). Observation on Protozoa parasite nematopsis in green tiger prawn (*Penaeus semisulcatus*) from Ang-sila pier, Chonburi province, Thailand. *Journal of the Microscopy Society of Thailand*, 4, 79-83.
- Ojumu, T. V., Yu, J., & Solomon, B. O. (2004). Production of Polyhydroxyalkanoates, a bacterial biodegradable polymer. *African Journal of Biotechnology*, 3, 18-24.
- Okafor, N. (2007). *Modern industrial microbiology and biotechnology*. NH, USA: Science Publishers, Enfield.
- Park, D. H., & Kim, B. S. (2011). Production of poly (3-hydroxybutyrate) and poly (3-hydroxybutyrate-co-4-hydroxybutyrate) by *Ralstonia eutropha* from soybean oil. *New Biotechnology*, 28, 719-724.
- Pouton, C. W., & Akhtar, S. (1996). Biosynthetic polyhydroxyalkanoates delivery and their potential in drug. *Advanced Drug Delivery Reviews*, 18, 133-162.
- Quillaguan, J., Hashim, S., Bento, F., Mattiasson, B., & Hatti-Kaul, R. (2005). Poly (β -hydroxybutyrate) production by a moderate halophile, *Halomonas boliviensis* LCI using starch hydrolysate as substrate. *Journal of Applied Microbiology*, 99, 151-157.

- Ramchander, M., Girisham, S., & Reddy, S. M. (2010). Production of PHB (Polyhydroxybutyrate) by *Rhodopseudomonas palustris* KU003 and *Rhodobacter capsulatus* KU002 under phosphate limitation. *International Journal of Applied Biology and Pharmaceutical Technology*, 3, 847-850.
- Reddy, C. S. K., Ghai, R., Rashmi, V. C., & Kalai. (2003). Polyhydroxyalkanoates: an overview. *Bioresource Technology*, 87, 137-146.
- Ryn, H. W., Sei, K. H., Yong, K. C., & Ho, H. C. (1997). Production of poly (3-hydroxybutyrate) by high cell density Fed-Batch culture of *Alcaligenes eutrophus* with phosphate limitation. *Biotechnology and Bioengineering*, 55, 30-32.
- Sangkharak, K., & Prasertsan, P. (2008). Nutrient optimization for production of polyhydroxybutyrate from halotolerant photosynthetic bacteria cultivated under aerobic-dark condition. *Electronic Journal of Biotechnology*, 11, 1-12.
- Satoh, H., Iwamoto, Y., Mino, T., & Matsuo, T. (1998). Activated sludge as a possible source of biodegradable plastic. *Water science Technology*, 38, 103-109.
- Savenkova, L., Gercberga, Z., Nikolaeva, V., Dzene, A., Biber, I., & Kalnin, M. (2000). Mechanical properties and biodegradation characteristics of PHB-based films. *Process Biochemistry*, 35, 573-579.
- Seo, J. K., Yoon, J. Y., Oh, J. T., & Kim, W. S. (1998). Optimum growth conditions and pH control solution for PHB biosynthesis in *Alcaligenes eutrophus*. *Journal of industrial and Engineering Chemistry*, 4, 215-220.
- Shojaosadati, S. A., Kolaei, S. M. V., Balaeipour, V., & Farroul, A. M. (2008). Recent advances in high cell density cultivation for production of recombinant protein . *Iranian Journal of Biotechnology*, 6(2), 63-83.
- Sudesh, K., Abe, H., & Doi, Y. (2000). Synthesis structure and properties of polyhydroxyalkanoates: biological polyesters. *Progress in Polymer Science*, 25, 1503-1555.
- Suriyamongkol, P., Weselake, R., Narine, S., Moloney, M., & Shah, S. (2007). Biotechnological approaches for the production of polyhydroxyalkanoates in microorganisms and plants A review. *Biotechnology Advances*, 25, 148-175.

- Tanamool, V., Danvirutai, P., Thanonkeo, P., Imai, T., & Kaewkannetra, P. (2009). Production of Poly- β -hydroxyric acid (PHB) from sweet sorhum juice by *Alcaligenes eutrophus* TISTR 1095 and *Alcaligenes latus* ATCC 29714 via batch fermentation. In *The 3rd International conference on Fermentation Technology for Value Added Agricultural Product (FerVAAP), 26-28 August 2009*. (p.95). Khon Kaen, Thailand.
- Tokiwa, Y., & Ugwu, C. U. (2007). Biotechnological production of (R)-3-hydroxybutyric acid monomer. *Journal of Biotechnology*, 132, 264-272.
- Tripathi, A. D., Srivastava, S. K., & Singh, R. P. (2013). Statistical optimization of physical process variables for bio-plastic (PHB) production by *Alcaligenes* sp. *Biomass and Bioenergy*, 3, 1-8.
- Verlinden, R. A. J., Hill, D. J., Kenward, M. A., Williams, C. D., & Radecka, I. (2007). Bacterial synthesis of biodegradable polyhydroxyalkanoates. *Journal of Applied Microbiology*, 102, 1437-1449.
- Vu, V. H., Phan, T. A., & Kim, K. (2009). Fungal strain improve for cellulose production using repeated and sequential mutagenesis. *Mycobiology*, 37(4), 267-271.
- Wang, F., & Lee, S. Y. (1997). Poly (3-Hydroxybutyrate) production with high productivity and high polymer content by a Fed-Batch culture Of *Alcaligenes latus* under nitrogen limitation. *Applied and Environmental Microbiology*, 63, 3707-3706.
- Wang, B., Sharma-Shivappa, R. R., Olson, J. W., & Khan, S. A. (2012). Upstream process optimization of polyhydroxybutyrate (PHB) by *Alcaligenes latus* using two-stage batch and fed-batch fermentation strategies. *Bioprocess Biosystem Engineering*, 1-12.
- Wang, B., Sharma-Shivappa, R. R., Olson, J. W., & Khan, S. A. (2013). Production of polyhydroxybutyrate (PHB) by *Alcaligenes latus* using sugarbeet juice. *Industrial Crop and Products*, 43, 802-811.
- Yezza, A., Halasz, A., Levadoux, W., & Hawari, J. (2007). Production of poly- β -hydroxybutyrate (PHB) by *Alcaligenes latus* from maple sap. *Application Microbial Biotechnology*, 77, 269-274.
- Yüksekdağ, Z.N., Aslim, B., Beyatil, Y., & Mercan, N. (2004). Effect of carbon and nitrogen sources and incubation times on poly-beta-hydroxybutyrate (PHB) synthesis by *Bacillus subtilis* 25 and *Bacillus megaterium* 12. *African Journal of Biotechnology*, 3,

63-66.

Zhang, S., Norrlöw, O., Wawrzynczyk, J., & Dey, E. S. (2004). Poly (3-Hydroxybutyrate) Biosynthesis in the biofilm of *Alcaligenes eutrophus*, using glucose enzymatically released from pulp fiber sludge. *Applied and Environmental Microbiology*, 70, 6776-6782.

มหาวิทยาลัยบูรพา
Burapha University