

DAFTAR PUSTAKA

- Abbasiliasi, S., Tan, J.S., Azmi T., Ibrahim T., Bashokouh, F., Ramakrishnan, N.R., Mustafa, S., and Ariff, A.B., 2017. Fermentation Factors Influencing the Production of Bacteriocins by Lactic Acid Bacteria: A Review. *RSC Advances*, Vol. 7 No. 47, pp. 29395–420.
- Adamczyk, B., Smolander, A., Kitunen, V., and Godlewski, M., 2010. Proteins as Nitrogen Source for Plants: A Short Story about Exudation of Proteases by Plant Roots. *Plant Signaling and Behavior*, Vol. 5 No. 7, pp. 817–19.
- Afifah, D.N., Sulchan, M., Syah, D., Yanti, Suhartono, M.T., and Kim, J.H., 2014. Purification and Characterization of a Fibrinolytic Enzyme from *Bacillus pumilus* 2.g Isolated from *Gembus*, an Indonesian Fermented Food. *Preventive Nutrition and Food Science*, Vol. 19 No. 3, pp. 213–19.
- Agrebi, R., Hmidet, N., Hajji, M., Ktari, N., Haddar, A., Zouari, N.F., and Nasri, M., 2010. Fibrinolytic Serine Protease Isolation from *Bacillus amyloliquefaciens* An6 Grown on *Mirabilis jalapa* Tuber Powders. *Applied Biochemistry and Biotechnology*, Vol. 162 No. 1, pp. 75–88.
- Akhtar, T., Hoq, M. M., and Mazid, M. A., 2017. Bacterial Proteases as Thrombolytics and Fibrinolytics. *Dhaka University Journal of Pharmaceutical Sciences*, Vol. 16 No. 2, pp. 255–69.
- Al-Mamun, M.R., Amrin, N., Begum, J., and Mazid, M.A., 2012. Thrombolytic Activity of Some Spices and Plants Available in Bangladesh. *Thai Journal of Pharmaceutical Sciences*, Vol. 36 No. 2, pp. 72–77.
- Al-mohanna, M.T., 2017. Morphology and Classification of Bacteria. *Microbiology*, pp. 1-19.
- Ali, M.R., Hossain, M.S., Islam, M.A., Arman, M.S.I., Raju, G.S., Dasgupta, P., and Noshin, T.F., 2014. Aspect of Thrombolytic Therapy: A Review. *Scientific World Journal*, Vol. 2014 No.1, pp. 1-8.
- Allen, R. J. and Waclaw, B., 2018. Bacterial Growth : A Statistical Physicist’s Guide. *Rep. Prog. Phys.*, Vol. 82 No. 1.
- Aradhye, P. K. and Chavan, M. D., 2014. Production and Characterization of Fibrinolytic Enzyme from *Aspergillus niger*. *World Journal of Pharmacy and Pharmaceutical Sciences*, Vol. 3 No. 9, pp. 843–51.
- Ariffin, F., Chew, S.H., Bhupinder, K., Karim, A.A., and Huda, N., 2011. Antioxidant Capacity and Phenolic Composition of Fermented *Centella asiatica* Herbal Teas. *Journal of the Science of Food and Agriculture*, Vol. 91 No. 15, pp. 2731–39.
- Ashipala, O. K. and He, Q., 2008. Optimization of Fibrinolytic Enzyme Production by *Bacillus subtilis* DC-2 in Aqueous Two-Phase System (Poly-Ethylene Glycol 4000 and Sodium Sulfate). *Bioresource Technology*, Vol. 99 No. 10, pp. 4112–19.
- Auld, D.S., 2013. Functional Classification. *Merops the peptidase database*, pp. 86–89.
- Bajaj, B.K., Singh, K., Khullar, M., Singh, K., and Bhardwaj, S., 2014. Optimization of Fibrinolytic Protease Production from *Bacillus subtilis* I-2 Using Agro-Residues. *Brazilian Archives of Biology and Technology*, Vol. 57 No. 5, pp. 653–62.
- Batomunkueva, B. P. and Egorov, N. S., 2002. Preparations of Extracellular Proteinases from *Aspergillus ochraceus* 513 and *Aspergillus alliaceus* 7dN1. *Mikrobiologiya*, Vol. 71 No. 1, pp. 56–58.
- Biswas, K., Azad, A.K., Sultana, T., Khan, F., Hossain, S., Alam, S., Chowdhary, R., and Khatun, Y., 2017. Assessment of In-Vitro Cholinesterase Inhibitory and Thrombolytic Potential of Bark and Seed Extracts of *Tamarindus indica* (L.)

- Relevant to the Treatment of Alzheimer's Disease and Clotting Disorders. *Journal of Intercultural Ethnopharmacology*, Vol. 6 No. 1, pp. 115–20.
- Borhan, M. Z., Ahmad, R., Rusop, M., and Abdullah, S., 2013. Green Extraction: Enhanced Extraction Yield of Asiatic Acid from *Centella asiatica* (L.) Nanopowders. *Journal of Applied Chemistry*, Vol. 2013, pp. 1–7.
- Brooks, G. F., Butel, J. S. and Morse, S. A., 2008. *Mikrobiologi Kedokteran Jawetz, Melnick*. Edited by Retna, N.E., Ramadhani, D., Karolina, S., Indriyani, F., Rianti, S.S.P., and Yulia, P., 23rd ed. Jakarta: Penerbit Buku Kedokteran EGC.
- Buttle, D. J., Mort, J. S. and Hospital, S., 2013. Cysteine Proteases. *Encyclopedia of Biological Chemistry 2nd edition*, pp. 589-92.
- Cera, E.D., 2009. Critical Review Serine Proteases. *IUBMB*, Vol. 61 No. 5, pp. 510–15.
- Chandrasekaran, S.D., Mohanasrinivasan, V., Tarafder, A., Shishodiya, E., Vaishnavi, B., and Naine, S.J., 2016. Combination of Clot Buster Enzymes and Herbal Extracts: A New Alternative for Thrombolytic Drugs. *Biocatalysis and Agricultural Biotechnology*, Vol. 8, pp. 152–57.
- Chandrika, U. G. and Prasad Kumara, P. A. A. S., 2015. Gotu Kola (*Centella asiatica*): Nutritional Properties and Plausible Health Benefits. *Advances in Food and Nutrition Research*, Vol. 76 No. 4, pp. 125-57.
- Chang, A.K., Kim, H.Y., Park, J.E., Acharya, P., Park, I.S., Yoon, S.M., You, H.J., Hahm, K.S., Park, J.K., and Lee, J.S., 2005. *Vibrio vulnificus* Secretes a Broad-Specificity Metalloprotease Capable of Interfering with Blood Homeostasis through Prothrombin Activation and Fibrinolysis. *Journal of Bacteriology*, Vol. 187 No. 20, pp. 6909–16.
- Charity, O.U., Igwe, F.U., Agwu, J., Peter, O.J., and Wolugbom, P.H., 2020. Nutrient and Phytochemical Composition of *Centella asiatica* Leaves. *Medicinal & Aromatic Plants*, Vol. 9 No. 2, pp. 1–7.
- Chew, L.Y., Toh, G.T., and Ismail, A., 2019. Application of Proteases for the Production of Bioactive Peptides. *Enzymes in Food Biotechnology*, pp. 247-61.
- Chisti, Y., 2010. Fermentation Technology. *Industrial Biotechnology Sustainable Growth and Economic Success*, pp. 149–71.
- Chitte, R.V., Deshmukh S.V., and Kanekar, P.P., 2011. Production, Purification, and Biochemical Characterization of a Fibrinolytic Enzyme from Thermophilic *Streptomyces* Sp. MCMB-379. *Applied Biochemistry and Biotechnology*, Vol. 165 No. 5–6, pp. 1406–13.
- Choi, J.Y., Kim, J.E., Park, J.J., Lee, M.R., Song, B.R., Park, J.W., Kang, M.J., Lee, H.S., Son, H.J., Hong, J.T., and Hwang, D.Y., 2018. The Anti-Inflammatory Effects of Fermented Herbal Roots of *Asparagus cochinchinensis* in an Ovalbumin-Induced Asthma Model. *Journal of Clinical Medicine*, Vol. 7 No. 377, pp. 1–22.
- Choi, N.S., Song, J.J., Chung, D.M., Kim, Y.J., Maeng, P.J., and Kim, S.H., 2009. Purification and Characterization of a Novel Thermoacid-Stable Fibrinolytic Enzyme from *Staphylococcus* Sp. Strain AJ Isolated from Korean Salt-Fermented Anchovy-Joet. *Journal of Industrial Microbiology and Biotechnology*, Vol. 36 No. 3, pp. 417–26.
- Choi, N.S., Yoo, K.H., Hahm, J.H., Yoon, K.S., Chang, K.T., Hyun, B.H., Maeng, P.J., and Kim, S.H., 2005. Purification and Characterization of a New Peptidase, Bacillopeptidase DJ-2, Having Fibrinolytic Activity: Produced by *Bacillus* Sp. DJ-2 from Doen-Jang. *Journal of Microbiology and Biotechnology*, Vol. 15 No. 1, pp. 72–79.
- Collen, D., and Lijnen, H.R., 2005. Thrombolytic Agents. *Thrombosis and Haemostasis*, Vol. 93 No. 4, pp. 627–30.

- Devi, C.S., Mohanasrinivasan, V., Sharma, P., Das, D., Vaishnavi, B., and Naine, S.J., 2015. Production, Purification and Stability Studies on Nattokinase: A Therapeutic Protein Extracted from Mutant *Pseudomonas aeruginosa* CMSS Isolated from Bovine Milk. *International Journal of Peptide Research and Therapeutics*, Vol. 22 No. 2, pp. 263–69.
- Dunn, B.M., and College, F., 2013. Aspartic Proteases. *Encyclopedia of Biological Chemistry*. 2nd ed. Vol. 1. pp. 123–27.
- Evangelista, J.H., Vera, M.J.D., Garcia, R.S., Joven, M.G., and Solidum, J.N., 2012. Preliminary Assessment of In Vitro Anticoagulant Activity vs Heparin 1,000 IU and Cytotoxicity of Selected Philippine Medicinal Plants. *International Journal of Chemical and Environmental Engineering Preliminary*, Vol. 3 No. 6, pp. 1–6.
- Fathima, S.N., Ahmad, S.V., and Kumar, B.R., 2015. Evaluation of In Vitro Thrombolytic Activity of Ethanolic Extract of *Curcuma caesia* Rhizomes. *International Journal of Pharma Research & Review*, Vol. 4 No. 11, pp. 50–54.
- Feng, R., Chen, L., and Chen, K., 2018. Fermentation Trip : Amazing Microbes. *Amazing Metabolisms. Annals of Microbiology*, No. 68, pp. 717–29.
- Forte, R., Cennamo, G., Finelli, M.L., Bonavolonta, P., Crecchio, G.D., and Greco, G.M., 2011. Combination of Flavonoids with *Centella asiatica* and *Melilotus* for Diabetic Cystoid Macular Edema without Macular Thickening. *Journal of Ocular Pharmacology and Therapeutics*, Vol. 27 No. 2, pp. 109–13.
- Fuentes, E., Guzmán, L., Alarcón, M., Moore, R., and Palomo, I., 2014. Thrombolytic / Fibrinolytic Mechanism of Natural Products. *Fibrinolysis and Thrombolysis Chapter 5*, pp. 107-121.
- Giraffa, G., 2004. Studying the Dynamics of Microbial Populations during Food Fermentation. *FEMS Microbiology Reviews*, Vol. 28 No. 2, pp. 251–60.
- Habe, H., Fukuoka, T., Kitamoto, D., and Sakaki, K., 2009. Biotransformation of Glycerol to D-Glyceric Acid by *Acetobacter tropicalis*. *Applied Microbiology and Biotechnology*, Vol. 81 No. 6, pp. 1033–39.
- Hassanpour, S., Kim, H.J., Saadati, A., Tebon, P., Xue, C., Dolder, F.W., Thakor, J., Baradaran, B., Mosafer, J., Baghbanzadeh, A., Barros, N.R., Hashemzaei, M., Lee, K.J., Lee, J., Zhang, S., Sun, W., Cho, H.J., Ahadian, S., Ashammakhi, A., Dokmeci, M.R., Mokhtarzadeh, A., and Khademhossein, A., 2020. “Thrombolytic Agents: Nanocarriers in Controlled Release. *Small Journal*, Vol. 16 No. 40, pp. 1–19.
- Hossain, S., Islam, R., Sultana, S., Rahman, H., and Bhowmick, A., 2018. Investigation of Thrombolytic and Antioxidant Potentials of *Centella asiatica*. *Galore International Journal of Health Sciences and Research*, Vol. 3 No. 4, pp. 52–58.
- Hussain, A., Bose, S., Wang, J.H., Yadav, M.K., Mahajan, G.B., and Kim, H., 2016. Fermentation, a Feasible Strategy for Enhancing Bioactivity of Herbal Medicines. *Food Research International*, Vol. 81, pp. 1–16.
- Hwang, K.J., Choi, K.H., Kim, M.J., Park, C.S., and Cha, J., 2007. Purification and Characterization of a New Fibrinolytic Enzyme of *Bacillus licheniformis* KJ-31, Isolated from Korean Traditional Jeot-Gal. *Journal of Microbiology and Biotechnology*, Vol. 17 No. 9, pp.1469–76.
- Jeong, J., Rhee, Y., and Kim, S., 2017. Physicochemical Properties and Fibrinolytic Activity of Ginseng Powder Fermented with *Bacillus subtilis* Isolated from Cheonggukjang. *American Journal of Plant Sciences*, Vol. 8 No. 8, pp. 1855–67.
- Jung, H.W., and Lee, S.P., 2009. Production of Carrot Pomace Fortified with Mucilage, Fibrinolytic Enzyme and Probiotics by Solid-State Fermentation Using the Mixed Culture of *Bacillus subtilis* and *Leuconostoc mesenteroides*. *Journal of Food Science and Nutrition*, Vol. 14 No. 4, pp. 335–42.

- Karim, R., Aziz, A., Bellah, F., Uddin, N., and Mahmud, S., 2018. Comparative Free Radical Scavenging, Thrombolytic, Cytotoxic, Antimicrobial and Analgesic Activities of Different Parts of *Centella asiatica* (Apiaceae) Research Article. *British Journal of Pharmaceutical and Medical Research*, Vol. 3 No. 2, pp. 885–90.
- Khan, I.N., Sarker, M.I., Almamun, A., Mazumder, K., and Mannan, A., 2011. Cytotoxic and Thrombolytic Activity of Ethanolic Extract of *Zanthoxylum budrunga* (Fam: Rutaceae) Leaves. *European Journal of Scientific Research*, Vol. 66 No. 2, pp. 303–10.
- Kho, M.C., Lee, Y.J., Park, J.H., Kim, H.Y., Yoon, J.J., Ahn, Y.M., Tan, R., Park, M.C., Cha, J.D., Choi, K.M., Kang, D.G., and Lee, H.S., 2016. Fermented Red Ginseng Potentiates Improvement of Metabolic Dysfunction in Metabolic Syndrome Rat Models. *Nutrients*, Vol. 8 No. 6, pp. 1-15.
- Kim, J.S., Kim, J.E., Choi, B.S., Park, S.E., Sapkota, K., Kim, S., Lee, H.H., Kim, C.S., Park, Y., Kim, M.K., Kim, Y.S., Kim, S.J., 2008. Purification and Characterization of Fibrinolytic Metalloprotease from *Perenniporia Fraxinea* Mycelia. *Mycological Research*, Vol. 112 No. 8, pp. 990–98.
- Klein, T., Eckhard, U., Solis, N., and Overall, C.M., 2018. Proteolytic Cleavage-Mechanisms, Function, and “Omic” Approaches for a Near-Ubiquitous Posttranslational Modification. *Chemical Reviews*, Vol. 118, pp. 1137 – 68.
- Ko, J.H., Yan, J.P., Zhu, L., and Qi, Y.P., 2004. Identification of Two Novel Fibrinolytic Enzymes from *Bacillus subtilis* QK02. *Comparative Biochemistry and Physiology - Toxicology and Pharmacology*, Vol. 137 No. 1, pp. 65–74.
- Kongkiattikajorn, J., 2014. Antioxidant Properties of Roselle Vinegar Production by Mixed Culture of *Acetobacter aceti* and *Acetobacter cerevisiae*. *Kasetsart Journal - Natural Science*, Vol. 48 No. 6, pp. 980–88.
- Kotb, E., 2015. Purification and Partial Characterization of Serine Fibrinolytic Enzyme from *Bacillus megaterium* KSK-07 Isolated from Kishk, a Traditional Egyptian Fermented Food. *Applied Biochemistry and Microbiology*, Vol. 51 No. 1, pp. 34–43.
- Kotb, E. 2012. Fibrinolytic Bacterial Enzymes with Thrombolytic Activity. *SpringerBriefs in Microbiology*. Pp. 1-85.
- Kotb, E., 2013. Activity Assessment of Microbial Fibrinolytic Enzymes. *Applied Microbiology and Biotechnology*, Vol. 97 No. 15, pp. 6647–65.
- Kotb, E., 2014. Purification and Partial Characterization of a Chymotrypsin-like Serine Fibrinolytic Enzyme from *Bacillus amyloliquefaciens* FCF-11 Using Corn Husk as a Novel Substrate. *World Journal of Microbiology and Biotechnology*, Vol. 30 no. 7, pp. 2071–80.
- Kumar, A., Pulicherla, K.K., Ram, K.S., Rao, S., 2010. Evolutionary Trend of Thrombolytics. *International Journal of Bio-Science and Bio-Technology*, Vol. 2 No. 4, pp. 51–68.
- Kunamneni, A., and Durvasula, R., 2014. Streptokinase-A Drug for Thrombolytic Therapy: A Patent Review. *Recent Advances in Cardiovascular Drug Discovery*, Vol. 9 No. 2, pp. 106–21.
- Lapsongphon, N., Rodtong, S., and Yongsawatdigul, J., 2013. Spent Brewery Yeast Sludge as a Single Nitrogen Source for Fibrinolytic Enzyme Production of *Virgibacillus* Sp. SK37. *Food Science and Biotechnology*, Vol. 22 No. 1, pp. 71–78.
- Lee, S., Jang, J.K., and Park, Y.S., 2016. Fed-Batch Fermentation of Onion Vinegar Using *Acetobacter tropicalis*. *Food Science and Biotechnology*, Vol. 25 No. 5, pp. 1407–11.

- Lee, S.G., Lee, E.J., Park, W.D., Kim, J.B., Kim, E.O., and Choi, S.W., 2012. Anti-Inflammatory and Anti-Osteoarthritis Effects of Fermented *Achyranthes japonica* Nakai. *Journal of Ethnopharmacology*, Vol. 142 No. 3, pp. 634–41.
- Leyn, S.A., Maezato, Y., Romine, M.F., and Rodionov, D.A., 2017. Genomic Reconstruction of Carbohydrate Utilization Capacities in Microbial-Mat Derived Consortia. *Frontiers in Microbiology*, Vol. 8, pp. 1–17.
- Li, G.Q., Wang, K.Y., Li, D.H., Wang, N., and Liu, D.H., 2012. Cloning, Expression and Characterization of a Gene from Earthworm *Eisenia fetida* Encoding a Blood-Clot Dissolving Protein. *PLoS ONE*, Vol. 7 No. 12.
- Lisdiyanti, P., Kawasaki, H., Seki, T., Yamada, Y., Uchimura, T., and Komagata, K., 2000. Systematic Study of the Genus *Acetobacter* with Descriptions of *Acetobacter indonesiensis* Sp. Nov., *Acetobacter tropicalis* Sp. Nov., *Acetobacter orleanensis* (Henneberg 1906) Comb. Nov., *Acetobacter lovaniensis* (Frateur 1950) Comb. Nov., and *Acetobacter* Est. *Journal of General and Applied Microbiology*, Vol. 46 No. 3, pp. 147–65.
- Liu, X., Kopparapu, N.K., Li, Y., Deng, Y., and Zheng, X., 2016. Biochemical Characterization of a Novel Fibrinolytic Enzyme from *Cordyceps militaris*. *International Journal of Biological Macromolecules*, Vol. 94, pp. 793–801.
- Lopina, O.D., 2016. Enzyme Inhibitors and Activators. *Intech Open Science Chapter 11*, pp. 243 – 57.
- Lubis, A.S.M., 2016. Optimasi Produksi Enzim Fibrinolitik Pada Media Limbah Cair Tahu. *Skripsi*. Universitas Airlangga, pp. 35.
- Lucy, J., Raharjo, P.F., Elvina, Florencia, L., Susanti, A.I., and Pinontoan, R., 2019. Clot Lysis Activity of *Bacillus subtilis* G8 Isolated from Japanese Fermented Natto Soybeans. *Applied Food Biotechnology*, Vol. 6 No. 2, pp. 101–9.
- Madhusudhan, N.C., Neeraja, P., and Devi, P., 2014. Comparative Analysis of Active Constituents in *Centella asiatica* Varieties (Majjaposhak and Subhodak). *International Journal of Pharmaceutical and Phytopharmacological Research*, Vol. 4 No. 2, pp. 105–8.
- Mahmood, A., Islam, S., Parvin, S., Muhammad, M., and Uddin, N., 2013. Phytochemical Screenings and Anti-Thrombolytic Activity of *Citrus assamenses*. *I.J.D.T.*, Vol. 4 No. 2, pp. 98–100.
- Mamlouk, D., and Gullo, M., 2013. Acetic Acid Bacteria: Physiology and Carbon Sources Oxidation. *Indian Journal of Microbiology*, Vol. 53 No. 4, pp. 377–84.
- Mander, P., Cho, S.S., Simkhada, J.R., Choi, Y.H., and Yoo, J.C., 2011. A Low Molecular Weight Chymotrypsin-like Novel Fibrinolytic Enzyme from *Streptomyces* Sp. CS624. *Process Biochemistry*, Vol. 46 No. 7, pp. 1449–55.
- Matsubara, K., Hori, K., Matsuura, Y., and Miyazawa, K., 1999. A Fibrinolytic Enzyme from a Marine Green Alga, *Codium latum*. *Phytochemistry*, Vol. 52 No. 6, pp. 993–99.
- Matsubara, K., Hori, K., Matsuura, Y., and Miyazawa, K., 2000. Purification and Characterization of a Fibrinolytic Enzyme and Identification of Fibrinogen Clotting Enzyme in a Marine Green Alga, *Codium divaricatum*. *Comparative Biochemistry and Physiology - B Biochemistry and Molecular Biology*, Vol. 125 No. 1, pp. 137–43.
- Matsutani, M., Hirakawa, H., Nishikura, M., Soemphol, W., Ali, I.A.I., Yakushi, T., and Matsushita, K., 2011. Increased Number of Arginine-Based Salt Bridges Contributes to the Thermotolerance of Thermotolerant Acetic Acid Bacteria, *Acetobacter tropicalis* SKU1100. *Biochemical and Biophysical Research Communications*, Vol. 409 No. 1, pp. 120–24.

- Mertz, C., Ranovona, Z., Mayer, C.D., Servent, A., Dornier, M., Danthu, P., and Ralison, C., 2019. The Nutrient Content of Two Folia Morphotypes of *Centella asiatica* (L) Grown in Madagascar. *African Journal of Food Agriculture Nutrition and Development*, Vol. 19 No. 3, pp. 14654–73.
- Mine, Y., Wong, A.H.K., and Jiang, B., 2005. Fibrinolytic Enzymes in Asian Traditional Fermented Foods. *Food Research International*, Vol. 38 No. 3, pp. 243–50.
- Mita, S. 2016. How Microbes Create Our Favorite Delicacies *Acetobacter tropicalis*. *Fermentation Stations*, Vol. 5 No. 6, pp. 1–4.
- Mohamad, N.A., Jusoh, N.A., Htike, Z.Z., and Win, S.L., 2014. Bacteria Identification from Microscopic Morphology : A Survey. *International Journal on Soft Computing, Artificial Intelligence and Applications (IJSCAI)*, Vol 3 No. 2, pp. 1-12.
- Narasimhan, M.K., Chandrasekaran, M., and Rajesh, M., 2015. Fibrinolytic Enzyme Production by Newly Isolated *Bacillus cereus* SRM-001 with Enhanced in-Vitro Blood Clot Lysis Potential. *Journal of General and Applied Microbiology*, Vol. 61 No. 5, pp.157–64.
- Newell, P., Chaston, J., Wang, Y., Winans, N., Sannino, D., Wong, A., Dobson, A., Kagle, J., and Douglas, A., 2014. In Vivo Function and Comparative Genomic Analyses of the *Drosophila* Gut Microbiota Identify Candidate Symbiosis Factors. *Frontiers in Microbiology*, Vol. 5, pp. 1–15.
- Nkhata, S.G., Ayua, E., Kamau, E.H., and Shingiro, J.B., 2018. Fermentation and Germination Improve Nutritional Value of Cereals and Legumes through Activation of Endogenous Enzymes. *Food Science and Nutrition*, Vol. 6 No. 8, pp. 2446–58.
- Owen, C.A., 2006. Serine Proteinases. *Encyclopedia of Respiratory Medicine*, pp. 1 – 10.
- Pamaya, D., Muchlissin, S.I., Maharani, E.T.W., Darmawati, S., and Ethica, S.N., 2018. Isolasi Bakteri Penghasil Enzim Protease *Bacillus amyloliquifaciens* IROD2 Pada Oncom Merah Pasca Fermentasi 48 Jam. *Seminar Nasional Edusaintek*, pp. 40–46.
- Park, J., Yoon, S., Kim, S., Lee, B., and Cheong, H., 2012. Characterization and Fibrinolytic Activity of *Acetobacter* Sp. FP1 Isolated from Fermented Pine Needle Extract. *Journal of Microbiology and Biotechnology*, Vol. 22 No. 2, pp. 215–19.
- Peerajan, S., Chaiyasut, C., Sirilun, S., Chaiyasut, K., Kesika, P., and Sivamaruthi, B.S., 2016. Enrichment of Nutritional Value of *Phyllanthus emblica* Fruit Juice Using the Probiotic Bacterium, *Lactobacillus Paracasei* HII01 Mediated Fermentation. *Food Science and Technology*, Vol. 36 No. 1, pp. 116–23.
- Peng, Y., Yang, X., and Zhang, Y., 2005. Microbial Fibrinolytic Enzymes: An Overview of Source, Production, Properties, and Thrombolytic Activity in Vivo. *Applied Microbiology and Biotechnology*, Vol. 69 No. 2, pp. 126–32.
- Poernomo, A.T., Isnaeni, and Purwanto. 2014. Aktivitas Invitro Enzim Fibrinolitik Ekstrak Tempe Hasil Fermentasi *Rhizopus oligosporus* ATCC 6010 Pada Substrat Kedelai Hitam. *Berkala Ilmiah Kimia Farmasi*, Vol. 4 No. 2, pp. 18–24.
- Poernomo, A.T., Sudjarwo, and Parasati, R.A., 2014. Purifikasi Parsial Enzim Fibrinolitik Tempe Kacang Koro (*Canavalia ensiformis*) Produk Fermentasi *Rhizopus oryzae* FNCC 6078. *Berkala Ilmiah Kimia Farmasi*, Vol. 3 No. 2, pp. 23–30.
- Prakash, V., Jaiswal, N., and Srivastava, M., 2017. A Review on Medicinal Properties of *Centella asiatica*.” *Asian Journal of Pharmaceutical and Clinical Research*, Vol. 10 No. 10, pp. 69–74.
- Prasad, S., Kashyap, R.S., Deopujari, J.Y., Purohit, H.J., Taori, G.M., and Dagainawala, H.F., 2006. Development of an in Vitro Model to Study Clot Lysis Activity of Thrombolytic Drugs. *Thrombosis Journal*, Vol. 4, pp. 9–12.

- Rahmadi, A., Abdiah, I., Sukarno, M.D., and Ningsih, T.P., 2013. Physicochemical and Antibacterial Characteristics of Virgin Coconut Oil Fermented with Lactic Acid Bacteria. *Jurnal Teknologi dan Industri Pangan*, Vol. 24 No. 2, pp. 178 – 83.
- Raju, E.V.N., and Divakar, G., 2014. An Overview on Microbial Fibrinolytic Proteases. *International Journal of Pharmaceutical Sciences and Research*, Vol. 5 No. 3, pp. 643–56.
- Rani, S., Boddupally, S.R., and Sushma, K., 2018. Evaluation of Thrombolytic Activity in Various Parts of Papaya Plant. *World Journal of Pharmaceutical Research*, Vol. 7 No. 15, pp. 663–67.
- Ratnasooriya, W.D., Fernando, T.S.P., and Madubashini, P.P., 2008. In Vitro Thrombolytic Activity of Sri Lankan Black Tea, *Camellia sinensis* (L.) O. Kuntze. *Journal of the National Science Foundation of Sri Lanka*, Vol. 36 No. 2, pp. 179–81.
- Rishikesh, Ghosh, D.R., and Rahman, M.M., 2013. “Thrombolytic Activity of *Centella asiatica* Leaves. *International Journal of Pharmacy*, Vol. 3 No. 2, pp. 308–11.
- Rohmah, M.K., Fickri, D.Z., Kasifa, W., and Wahyuni, K.I., 2019. Uji Aktivitas Fibrinolisis Ekstrak Alkaloid Total Rimpang Lengkuas Merah (*Alpinia purpurata* (Vielli) K.Schum) Secara In Vitro. *Journal of Pharmaceutical Care Anwar Medika*, Vol. 2 No. 1, pp. 83-95.
- Rosada, K.K., 2018. Enhanced Acetic Acid Production from Manalagi Apple (*Malus sylvestris* Mill) by Mixed Cultures of *Saccharomyces cerevisiae* and *Acetobacter aceti* in Submerged Fermentation. *Journal of Physics: Conference Series*, Vol. 1013 No. 1, pp. 1 – 7.
- Saichana, N., Matsushita, K., Adachi, O., Frébort, I., and Frebortova, J., 2015. Acetic Acid Bacteria: A Group of Bacteria with Versatile Biotechnological Applications. *Biotechnology Advances*, Vol. 33 No. 6, pp.1260–71.
- Salamah, A., Srihardyastutie, A., Prasetyawan, S., and Safitri, A., 2019. Influence of Mixed Cultures of *Saccharomyces cerevisiae* and *Acetobacter aceti* for Hydrolysis of Tannins in the Cabbage Fermentation (*Brassica oleracea* l.Var.Capitata). *IOP Conference Series: Materials Science and Engineering*, Vol. 546 No. 6, pp. 1 – 7.
- Sales, A.E., Souza, F.A.S.D., Teixeira, J.A., Porto, T.S., and Porto, A.L.F., 2013. Integrated Process Production and Extraction of the Fibrinolytic Protease from *Bacillus* Sp. UFPEDA 485. *Applied Biochemistry and Biotechnology*, Vol. 170 No. 7, pp. 1676–88.
- Sharma, K.M., Kumar, R., Panwar, S., and Kumar, A., 2017. Microbial Alkaline Proteases : Optimization of Production Parameters and Their Properties. *Journal of Genetic Engineering and Biotechnology*, Vol. 15 No. 1, pp. 115–26.
- Sherwani, S.K., Bashir, A., Haider, S.S., Shah, M.A., and Kazmi, S.U., 2013. “Thrombolytic Potential of Aqueous and Methanolic Crude Extracts of *Camellia sinensis* (Green Tea): In Vitro Study. *Phytojournal*, Vol. 2 No. 1, pp. 125–29.
- Siddique, K.I., Uddin, M.M.N., Islam, M.S., Parvin, S., and Shahriar, M., 2013. Phytochemical Screenings, Thrombolytic Activity and Antimicrobial Properties of the Bark Extracts of *Averrhoa bilimbi*. *Journal of Applied Pharmaceutical Science*, Vol. 3 No. 3, pp. 94–96.
- Sidelmann, J.J., Gram, G., Jespersen, J., and Kluft, C., 2000. Fibrin Clot Formation and Lysis: Basic Mechanism. *Seminars in Thrombosis and Hemostasis*, Vol. 26 No. 6, pp. 605 – 18.
- Silhavy, K., and Mandl, K., 2006. *Acetobacter tropicalis* in Spontaneously Fermented Wine with Vinegar Fermentation in Austria. *Mitteilungen Klosterneuburg*, Vol. 56, pp. 102–7.

- Simkhada, J.R., Mander, P., Cho, S.S., and Yoo, J.C., 2010. A Novel Fibrinolytic Protease from *Streptomyces* Sp. CS684. *Process Biochemistry*, Vol. 45 No. 1, pp. 88–93.
- Singh, R., 2017. Microbial Biotransformation: A Process for Chemical Alterations. *Journal of Bacteriology & Mycology*, Vol. 4 No. 2, pp. 47–51.
- Soemphol, W., Deeraksa, A., Matsutani, M., Yakushi, T., Toyama, H., Adachi, O., Yamada, M., and Matsushita, K., 2011. Global Analysis of the Genes Involved in the Thermotolerance Mechanism of Thermotolerant *Acetobacter tropicalis* SKU1100. *Bioscience, Biotechnology and Biochemistry*, Vol. 75 No. 10, pp. 1921–28.
- Srianta, I., Widharna, R.M., and Kardono, L.B.S., 2013. Bioaktivitas Produk Fermentasi *Monascus*. *Journal of Pharmaceutical Science and Pharmacy Practice*, Vol. 1.
- Stephani, L., Tjandrawinata, R.R., Afifah, D.N., Lim, Y., Ismaya, W.T., and Suhartono, M.T., 2017. “Food Origin Fibrinolytic Enzyme with Multiple Actions. *Hayati Journal of Biosciences*, Vol. 24 No. 3, pp. 124–30.
- Sun, Y., and Kroll, M.H., 2018. Hypercoagulable States. *Cardiology Secrets. Fifth Ed.*, pp. 534-39.
- Sutardi, 2017. Kandungan Bahan Aktif Tanaman Pegagan Dan Khasiatnya Untuk Meningkatkan Sistem Imun Tubuh. *Jurnal Penelitian Dan Pengembangan Pertanian*, Vol. 35 No. 3, pp. 121.
- Swain, M.R., Anandharaj, M., Ray, R.C., and Rani, R.P., 2014. Fermented Fruits and Vegetables of Asia: A Potential Source of Probiotics. *Biotechnology Research International*, pp. 1–19.
- Thokchom, S., and Joshi, S.R., 2014. Screening of Fibrinolytic Enzymes from Lactic Acid Bacterial Isolates Associated with Traditional Fermented Soybean Foods. *Food Science and Biotechnology*, Vol. 23 No. 5, pp. 1601–4.
- Ueda, M., Kubo, T., Miyatake, K., and Nakamura, T., 2007. Purification and Characterization of Fibrinolytic Alkaline Protease from *Fusarium* Sp. BLB. *Applied Microbiology and Biotechnology*, Vol. 74 No. 2, pp. 331–38.
- Uesugi, Y., Usuki, H., Iwabuchi, M., and Hatanaka, T., 2011. Highly Potent Fibrinolytic Serine Protease from *Streptomyces*. *Enzyme and Microbial Technology*, Vol. 48 No. 1, pp. 7–12.
- Varadharajan, V., Shanmugam, S., and Ramaswamy, A., 2015. Thrombolytic Activity of the Ethanolic Extract of *Vitis vinifera* Seeds. *Bangladesh Journal of Pharmacology*, Vol. 10 No. 4, pp. 964–65.
- Vinolina, N.S., Nainggolan, M., and Siregar, R., 2018. Production Enhancement Technology of Pegagan (*Centella asiatica*). *Agrivita*, Vol. 40 No. 2, pp. 304–12.
- Wang, B., Pu, Y., Gerken, H.G., Xie, Y., Lin, L., Chen, H., and Lu, Y., 2018. Production of D-Glyceric Acid by a Two-Step Culture Strategy Based on Whole-Cell Biocatalysis of *Acetobacter tropicalis*. *Chemical and Biochemical Engineering Quarterly*, Vol. 32 No. 1, pp. 135–40.
- Wang, C.T., Ji, B.P., Li, B., Nout, R., Li, P.L., Ji, H., and Chen, L.F., 2006. Purification and Characterization of a Fibrinolytic Enzyme of *Bacillus subtilis* DC33, Isolated from Chinese Traditional Douchi. *Journal of Industrial Microbiology and Biotechnology*, Vol. 33 No. 9, pp. 750–58.
- Wang, C., Ming, D.U., Zheng, D., Kong, F., Zu, G., and Feng, Y., 2009. Purification and Characterization of Nattokinase from *Bacillus subtilis* Natto B-12. *Journal of Agricultural and Food Chemistry*, Vol. 57 No. 20, pp. 9722–29.
- Wang, L., Fan, D., Chen, W., and Terentjev, E.M., 2015. Bacterial Growth, Detachment and Cell Size Control on Polyethylene Terephthalate Surfaces. *Nature Publishing Group*, pp. 1–11.

- Wang, S.L., Chen, H.J., Liang, T.W., and Lin, Y.D., 2009. A Novel Nattokinase Produced by *Pseudomonas* Sp. TKU015 Using Shrimp Shells as Substrate. *Process Biochemistry*, Vol. 44 No. 1, pp. 70–76.
- Wang, S.L., Yang, C.H., Liang, T.W., and Yen, Y.H., 2008. Optimization of Conditions for Protease Production by *Chryseobacterium taeanense* TKU001. *Bioresource Technology*, Vol. 99 No. 9, pp. 3700–7.
- Wilkesman, J., and Kurz, L., 2009. Protease Analysis by Zymography: A Review on Techniques and Patents. *Recent Patents on Biotechnology*, Vol. 3 No. 3, pp. 175–84.
- Wright, R., 2019. Mass Spectrometry Gas Analysis. *Encyclopedia of Analytical Science*, No. 2001, pp. 366–74.
- Wu, L., Chen, C., Cheng, C., Dai, H., Ai, Y., Lin, C., and Chung, Y., 2018. Antimicrobial, and Antiaging Activities of *Magnolia officinalis* Extracts after *Aspergillus niger* Fermentation. *Hindawi BioMed Research International*, No. 1, pp. 1 – 11.
- Wu, T., Wang, N., Zhang, Y., and Xu, X., 2013. Advances in the Study on Microbial Fermentation and Transformation of Traditional Chinese Medicine. *African Journal of Microbiology Research*, Vol. 7 No. 17, pp. 1644–50.
- Xiaolan, L., Xiang, D.L., Ping, L.F., Qun, Z.X., and Jing, X., 2005. Purification and Characterization of a Novel Fibrinolytic Enzyme from *Rhizopus chinensis* 12. *Applied Microbiology and Biotechnology*, Vol. 67 No. 2, pp. 209–14.
- Yogesh, D., and Halami, P.M., 2017. Fibrinolytic Enzymes of *Bacillus* Spp.: An Overview. *International Food Research Journal*, Vol. 24 No. 1, pp. 35–47.
- York, M.J., 2013. Clinical Pathology. A Comprehensive Guide to Toxicology in Preclinical Drug Development. *Elsevier Inc.*
- Yuniastuti, A., 2014. Buku Monograf Probiotik (Dalam Perspektif Kesehatan). Semarang: Unnes Press, pp. 1 – 100.
- Zahara, K., 2014. Clinical and Therapeutic Benefits of *Centella asiatica*. *Pure and Applied Biology*, Vol. 3 No. 4, pp. 152–59.
- Zhao, W., Liu, Y., Latta, M., Ma, W., Wu, Z., and Chen, P., 2019. Probiotics Database: A Potential Source of Fermented Foods. *International Journal of Food Properties*, Vol. 22 No. 1, pp.197–216.
- Zhao, Z., Corredig, M., and Gaygadzhiev, Z., 2019. Short Communication: Determination of the Whey Protein Index in Milk Protein Concentrates. *Journal of Dairy Science*, Vol. 102 No. 9, pp. 7760–64.