

DAFTAR PUSTAKA

- Abadi, A.L., 1987. Biologi Ganoderma boninense Pat pada kelapa sawit (*Elaeis guineensis* Jacq.) dan pengaruh beberapa mikroba tanah antagonistik terhadap pertumbuhannya. *Disertasi. Bogor: Program Pascasarjana Institut Pertanian Bogor.*
- Abhilash, P.C., Dubey, R.K., Tripathi, V., Gupta, V.K. and Singh, H.B., 2016. Plant growth-promoting microorganisms for environmental sustainability. *Trends in biotechnology*, 34(11), pp.847-850.
- Agrios, G.N., 2005. Introduction to plant pathology. *Elsevier Academic Press Publication.*
- Alexander, A., Dayou, J. and Chong, K.P., 2015, July. Morphological changes of Ganoderma boninense mycelia after challenged by Trichoderma and Bacillus. In *AIP Conference Proceedings* (Vol. 1669, No. 1, p. 020075). AIP Publishing.
- Alexander, A., Abdullah, S., Rossall, S. and Chong, K.P., 2017. Evaluation of the efficacy and mode of action of biological control for suppression of Ganoderma boninense in oil palm. *Pakistan J Bot.* 2017a, 49, pp.1193-99.
- Azizah, S.N., Mubarik, N.R. and Sudirman, L.I., 2015. Potential of chitinolytic *Bacillus amyloliquefaciens* SAHA 12.07 and *Serratia marcescens* KAHN 15.12 as biocontrol agents of Ganoderma boninense. *Res J Microbiol*, 10, pp.452-465.
- Bakhtiar, Y., Yahya, S., Sumaryono, W., Sinaga, M.S. and Budi, S.W., 2013. Adaptation of Oil Palm Seedlings Inoculated with Arbuscular Mycorrhizal Fungi and Mycorrhizal Endosymbiotic Bacteria *Bacillus subtilis* B10 towards Biotic Stress of Pathogen Ganoderma boninense Pat. *Microbiology Indonesia*, 6(4), p.3.
- Bruce, A., Wheatley, R.E., Humphris, S.N., Hackett, C.A. and Florence, M.E., 2000. Production of volatile organic compounds by Trichoderma in media containing different amino acids and their effect on selected wood decay fungi. *Holzforschung*, 54(5), pp.481-486.
- Chang, H.T., Cheng, Y.H., Wu, C.L., Chang, S.T., Chang, T.T. and Su, Y.C., 2008. Antifungal activity of essential oil and its constituents from *Calocedrus*

- macrolepis var. formosana Florin leaf against plant pathogenic fungi. *Bioresource technology*, 99(14), pp.6266-6270.
- Chauhan, A.K., Maheshwari, D.K., Kim, K. and Bajpai, V.K., 2016. Termitarium-inhabiting *Bacillus endophyticus* TSH42 and *Bacillus cereus* TSH77 colonizing *Curcuma longa* L.: isolation, characterization, and evaluation of their biocontrol and plant-growth-promoting activities. *Canadian journal of microbiology*, 62(10), pp.880-892.
- Chaurasia, B., Pandey, A., Palni, L.M.S., Trivedi, P., Kumar, B. and Colvin, N., 2005. Diffusible and volatile compounds produced by an antagonistic *Bacillus subtilis* strain cause structural deformations in pathogenic fungi in vitro. *Microbiological research*, 160(1), pp.75-81.
- Chaves-López, C., Serio, A., Gianotti, A., Sacchetti, G., Ndagijimana, M., Ciccarone, C., Stellarini, A., Corsetti, A. and Paparella, A., 2015. Diversity of food-borne *Bacillus* volatile compounds and influence on fungal growth. *Journal of applied microbiology*, 119(2), pp.487-499.
- Choudhary, D.K. and Johri, B.N., 2009. Interactions of *Bacillus* spp. and plants—with special reference to induced systemic resistance (ISR). *Microbiological research*, 164(5), pp.493-513.
- Cordovez, V., Mommer, L., Moisan, K., Lucas-Barbosa, D., Pierik, R., Mumm, R., Carrion, V.J. and Raaijmakers, J.M., 2017. Plant phenotypic and transcriptional changes induced by volatiles from the fungal root pathogen *Rhizoctonia solani*. *Frontiers in plant science*, 8, p.1262.
- Corley, R.H.V. and Tinker, P.B., 2008. *The oil palm*. John Wiley & Sons.
- Dandurishvili, N., Toklikishvili, N., Ovadis, M., Eliashvili, P., Giorgobiani, N., Keshelava, R., Tediashvili, M., Vainstein, A., Khmel, I., Szegedi, E. and Chernin, L., 2011. Broad-range antagonistic rhizobacteria *Pseudomonas fluorescens* and *Serratia plymuthica* suppress *Agrobacterium* crown gall tumours on tomato plants. *Journal of applied microbiology*, 110(1), pp.341-352.
- Dewi, A. 2017. Bakteri endofit diazotrof (bed) dari tanaman tebu varietas unggul bululawang. Skripsi. Yogyakarta. Program Sarjana Universitas Gadjah Mada, Yogyakarta.

- Farag, M.A., Ryu, C.M., Sumner, L.W. and Paré, P.W., 2006. GC–MS SPME profiling of rhizobacterial volatiles reveals prospective inducers of growth promotion and induced systemic resistance in plants. *Phytochemistry*, 67(20), pp.2262-2268.
- Fialho, M.B., Moraes, M.H.D.D., Tremocoldi, A.R. and Pascholati, S.F., 2011. Potential of antimicrobial volatile organic compounds to control *Sclerotinia sclerotiorum* in bean seeds. *Pesquisa Agropecuária Brasileira*, 46(2), pp.137-142.
- Fiddaman, P.J. and Rossall, S., 1993. The production of antifungal volatiles by *Bacillus subtilis*. *Journal of Applied Bacteriology*, 74(2), pp.119-126.
- Flood, J., Hasan, Y. and Foster, H., 2002. Ganoderma diseases of oil palm—an interpretation from Bah Lias Research Station. *Planter*, 78(921), pp.689-710.
- George, P., Gupta, A., Gopal, M., ChandraMohan, R., Thomas, L. and Thomas, G.V., 2011. Antagonistic activity of coconut rhizospheric and endophytic *Bacillus* spp. against *Ganoderma applanatum* and *Thielaviopsis paradoxa*. *Journal of Plantation Crops*, 39(2), pp.278-284.
- Groenhagen, U., Baumgartner, R., Bailly, A., Gardiner, A., Eberl, L., Schulz, S. and Weisskopf, L., 2013. Production of bioactive volatiles by different *Burkholderia ambifaria* strains. *Journal of chemical ecology*, 39(7), pp.892-906.
- Hester, R.E. and Harrison, R.M. eds., 1995. *Volatile organic compounds in the atmosphere*(No. 4). Royal Society of Chemistry.
- Ho, Y.W. and Nawawi, A., 1985. *Ganoderma boninense* Pat. from based stem rot of oil palm [*Elaeis guineensis*] in Peninsular Malaysia. *Pertanika*.
- Huang, C.J., Tsay, J.F., Chang, S.Y., Yang, H.P., Wu, W.S. and Chen, C.Y., 2012. Dimethyl disulfide is an induced systemic resistance elicitor produced by *Bacillus cereus* C1L. *Pest management science*, 68(9), pp.1306-1310.

- Humphris, S.N., Bruce, A., Buultjens, E. and Wheatley, R.E., 2002. The effects of volatile microbial secondary metabolites on protein synthesis in *Serpula lacrymans*. *FEMS Microbiology Letters*, 210(2), pp.215-219.
- Kamal, M.M., Lindbeck, K., Savocchia, S. and Ash, G.J., 2014, August. Bacterial biocontrol of diseases caused by *Sclerotinia* in Australia. In *XXIX International Horticultural Congress on Horticulture: Sustaining Lives, Livelihoods and Landscapes (IHC2014): 1105* (pp. 123-130).
- Kanchiswamy, C.N., Malnoy, M. and Maffei, M.E., 2015. Chemical diversity of microbial volatiles and their potential for plant growth and productivity. *Frontiers in plant science*, 6, p.151.
- Kanchiswamy, C.N., Malnoy, M. and Maffei, M.E., 2015. Bioprospecting bacterial and fungal volatiles for sustainable agriculture. *Trends in Plant Science*, 20(4), pp.206-211.
- Khairudin, H., 1995. Basal stem rot of oil palm caused by *Ganoderma boninense* An update. In *PORIM International Palm Oil Congress: Update and Vision September 22-25, 1993 Kuala Lumpur, Malaysia* (No. L-0314). PORIM.
- Williams, J. and Koppmann, R., 2007. *Volatile organic compounds in the atmosphere: an overview* (pp. 1-32). Blackwell Publishing Ltd.: Oxford, UK.
- Korpi, A., Järnberg, J. and Pasanen, A.L., 2009. Microbial volatile organic compounds. *Critical reviews in toxicology*, 39(2), pp.139-193.
- Landum, M.C., do Rosário Félix, M., Alho, J., Garcia, R., Cabrita, M.J., Rei, F. and Varanda, C.M., 2016. Antagonistic activity of fungi of *Olea europaea* L. against *Colletotrichum acutatum*. *Microbiological research*, 183, pp.100-108.
- Li, X.Y., Mao, Z.C., Wu, Y.X., Ho, H.H. and He, Y.Q., 2015. Comprehensive volatile organic compounds profiling of *Bacillus* species with biocontrol properties by head space solid phase microextraction with gas chromatography-mass spectrometry. *Biocontrol science and technology*, 25(2), pp.132-143.
- Liu, W., Mu, W., Zhu, B. and Liu, F., 2008. Antifungal activities and components of VOCs produced by *Bacillus subtilis* G8. *Curr Res Bacteriol*, 1, pp.28-34.

- Liu, Y., Du, J., Lai, Q., Zeng, R., Ye, D., Xu, J. and Shao, Z., 2017. Proposal of nine novel species of the *Bacillus cereus* group. *International journal of systematic and evolutionary microbiology*, 67(8), pp.2499-2508.
- Madigan, T.M., J.M. Martinko, K.S. Bender, D.H. Buckley, & D.A. Stahl. 2015. Brock Biology of Microorganisms. 14th Edition. Pearson, United States.
- Maffei, M.E., Gertsch, J. and Appendino, G., 2011. Plant volatiles: production, function and pharmacology. *Natural product reports*, 28(8), pp.1359-1380.
- Maruzzella, J.C., 1961. Antimicrobial substances from ferns. *Nature*, 191(4787), p.518.
- Mendis, H.C., Thomas, V.P., Schwientek, P., Salamzade, R., Chien, J.T., Waidyaratne, P., Kloepper, J. and De La Fuente, L., 2018. Strain-specific quantification of root colonization by plant growth promoting rhizobacteria *Bacillus firmus* I-1582 and *Bacillus amyloliquefaciens* QST713 in non-sterile soil and field conditions. *PloS one*, 13(2), p.e0193119.
- Minerdi, D., Bossi, S., Maffei, M.E., Gullino, M.L. and Garibaldi, A., 2011. *Fusarium oxysporum* and its bacterial consortium promote lettuce growth and expansin A5 gene expression through microbial volatile organic compound (MVOC) emission. *FEMS microbiology ecology*, 76(2), pp.342-351.
- Moore-Landecker, E. and Stotzky, G., 1972. Inhibition of fungal growth and sporulation by volatile metabolites from bacteria. *Canadian journal of microbiology*, 18(7), pp.957-962.
- Moore-Landecker, E. and Stotzky, G., 1974. Effects of concentration of volatile metabolites from bacteria and germinating seeds on fungi in the presence of selective absorbents. *Canadian journal of microbiology*, 20(1), pp.97-103.
- Palanna, K.B., Narendrappa, T., Basavaraj, S. and Shreenivasa, K.R., 2017. Efficacy of Fungal and Bacterial Bio-control Agents on *Ganoderma* Spp. Causing Foot Rot of Arecanut. *International Journal of Agriculture Innovations and Research*, 6(2), pp.299-344.
- Public Health England. 2015. UK Standards for Microbiology Investigations: Identification of *Bacillus* species. National Health Services, London.
- Rajer, F.U., Wu, H., Xie, Y., Xie, S., Raza, W., Tahir, H.A.S. and Gao, X., 2017. Volatile organic compounds produced by a soil-isolate, *Bacillus subtilis* FA26 induce adverse ultra-structural changes to the cells of *Clavibacter*

- michiganensis ssp. sepedonicus, the causal agent of bacterial ring rot of potato. *Microbiology*, 163(4), pp.523-530.
- Rajini, K.S., Aparna, P., Sasikala, C. and Ramana, C.V., 2011. Microbial metabolism of pyrazines. *Critical reviews in microbiology*, 37(2), pp.99-112.
- Rustam. 2016. Antifungal study of *Bacillus subtilis* BR2 on *Ganoderma* sp., the cause of basal stem rot disease in oil palm plants. *AJETI* 4(3):54-58.
- Ryu, C.M., Farag, M.A., Hu, C.H., Reddy, M.S., Kloepper, J.W. and Paré, P.W., 2004. Bacterial volatiles induce systemic resistance in *Arabidopsis*. *Plant physiology*, 134(3), pp.1017-1026.
- Saharan, B.S. and Nehra, V., 2011. Plant growth promoting rhizobacteria: a critical review. *Life Sci Med Res*, 21(1), p.30.
- Sales, D.L., Oliveira, O.P., Cabral, M.E.S., Dias, D.Q., Kerntopf, M.R., Coutinho, H.D.M., Costa, J.G.M., Freitas, F.R.D., Ferreira, F.S., Alves, R.R.N. and Almeida, W.O., 2015. Chemical identification and evaluation of the antimicrobial activity of fixed oil extracted from *Rhinella jimi*. *Pharmaceutical biology*, 53(1), pp.98-103.
- Schmidt, R., Cordovez, V., De Boer, W., Raaijmakers, J. and Garbeva, P., 2015. Volatile affairs in microbial interactions. *The ISME journal*, 9(11), p.2329.
- Siddiquee, S., Cheong, B.E., Taslima, K., Kausar, H. and Hasan, M.M., 2012. Separation and identification of volatile compounds from liquid cultures of *Trichoderma harzianum* by GC-MS using three different capillary columns. *Journal of chromatographic science*, 50(4), pp.358-367.
- Singh, S.K., Strobel, G.A., Knighton, B., Geary, B., Sears, J. and Ezra, D., 2011. An endophytic *Phomopsis* sp. possessing bioactivity and fuel potential with its volatile organic compounds. *Microbial ecology*, 61(4), pp.729-739.
- Stotzky, G., Schenck, S. and Papavizas, G.C., 1976. Volatile organic compounds and microorganisms. *CRC critical reviews in microbiology*, 4(4), pp.333-382.
- Stringlis, I.A., Zhang, H., Pieterse, C.M., Bolton, M.D. and de Jonge, R., 2018. Microbial small molecules—Weapons of plant subversion. *Natural product reports*, 35(5), pp.410-433.

- Susanto, A., Sudharto, P.S. and Purba, R.Y., 2005. Enhancing biological control of basal stem rot disease (*Ganoderma boninense*) in oil palm plantations. *Mycopathologia*, 159(1), pp.153-157.
- Tahir, H.A.S., Gu, Q., Wu, H., Niu, Y., Huo, R. and Gao, X., 2017. *Bacillus* volatiles adversely affect the physiology and ultra-structure of *Ralstonia solanacearum* and induce systemic resistance in tobacco against bacterial wilt. *Scientific reports*, 7, p.40481.
- Tirranen, L.S. and Gitelson, I.I., 2006. The role of volatile metabolites in microbial communities of the LSS higher plant link. *Advances in Space Research*, 38(6), pp.1227-1232.
- Turner, P.D., 1981. *Oil palm diseases and disorders*. Oxford Univ. Press.
- Urbanek, A., Szadziowski, R., Stepnowski, P., Boros-Majewska, J., Gabriel, I., Dawgul, M., Kamysz, W., Sosnowska, D. and Gołębiowski, M., 2012. Composition and antimicrobial activity of fatty acids detected in the hygroscopic secretion collected from the secretory setae of larvae of the biting midge *Forcipomyia nigra* (Diptera: Ceratopogonidae). *Journal of insect physiology*, 58(9), pp.1265-1276.
- Webster, J. and Weber, R.W.S., 2007. Introduction to fungi Third edition Cambridge University Press. *Cambridge, UK*.
- Wheatley, R.E., 2002. The consequences of volatile organic compound mediated bacterial and fungal interactions. *Antonie Van Leeuwenhoek*, 81(1-4), pp.357-364.
- Wood, B.J., 2007. Opportunities for oil palm R & D in further meeting the challenges of the new dynamics. *Planter*, 83(972), pp.155-177.
- Yuan, J., Raza, W., Shen, Q. and Huang, Q., 2012. Antifungal activity of *Bacillus amyloliquefaciens* NJN-6 volatile compounds against *Fusarium oxysporum* f. sp. *cubense*. *Appl. Environ. Microbiol.*, 78(16), pp.5942-5944.
- Zhang, X., Li, B., Wang, Y., Guo, Q., Lu, X., Li, S. and Ma, P., 2013. Lipopeptides, a novel protein, and volatile compounds contribute to the antifungal activity of the biocontrol agent *Bacillus atrophaeus* CAB-1. *Applied microbiology and biotechnology*, 97(21), pp.9525-9534.



- Zheng, M., Shi, J., Shi, J., Wang, Q. and Li, Y., 2013. Antimicrobial effects of volatiles produced by two antagonistic Bacillus strains on the anthracnose pathogen in postharvest mangos. *Biological Control*, 65(2), pp.200-206.
- Zou, C.S., Mo, M.H., Gu, Y.Q., Zhou, J.P. and Zhang, K.Q., 2007. Possible contributions of volatile-producing bacteria to soil fungistasis. *Soil Biology and Biochemistry*, 39(9), pp.2371-2379.