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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Addgene, 2018. https://www.addgene.org/vector-database/7040/. Diakses pada 13 Pebruari 2018.

Alcantara, R., Dibax, R.A., Oliviera, R.A., Filho, J.C.B., Daros. 2014. Plant regeneration and histological study of the somatic embryogenesis of sugarcane (*Saccharum* spp.) cultivars RB55156 and RB72454. *E Acta Sci*. 36: 63-72.

Alrich, P., Higgins, W. 2014. *Phalaenopsis*. Bijdragen tot de Flora Nederlandsch Indie.

Anjaneyulu, C., Giri, C.C. 2011. Direct somatic embryogenesis from mature zygotic embryo and conversion to plants in medical tree *Terminalia chebula* Retz. *Tree for Sci Biotech*. 5: 33-37.

Aoyama, T., Chua, N. 1997. A glucocorticoid-mediated transcriptional induction system in transgenic plants. *Plant J*. 11: 605-612.

Arditti, J., Ernst, R. 1993. *Micropropagation of orchids*. John Wiley and Sons, Inc. Canada.

Assagaf, M.H. 2012. 1001 spesies anggrek yang dapat berbunga di Indonesia. Pisangan Ciputat: Kataelha. p. 291.

Alexa, A., Rahnenführer, J. 2019. *Gene set enrichment analysis with topGO*. tersedia pada: http://www.mpi-sb.mpg.de/~alexa. Diakses: 14 May 2019.

Ayil-Gutiérrez, B., Galaz-Avalos, R.M., Peña-Cabrera, E., Loyola-Vargas, V.M. 2013. Dynamics of the concentration of IAA and some of its conjugates during the induction of somatic embryogenesis in Coffea canephora. *Plant Signal Behav*. 8: e26998.

Badan Pusat Statistik. 2017. Statistika Tanaman Hias Indonesia, Jakarta.

Balilashaki, K. dan Ghehsareh, M.G. 2016. Micropropagation of *Phalaenopsis amabilis* var. Manila by leaves obtained from *in vitro* culturing the nodes of flower stalks. *Not Sci Biol*. 8: 164-169.

Balilashaki, K., Vehedi, M., Karimi, R. 2015. *In vitro* direct regeneration form node and leaf exlants of *Phalaenopsis* cv. 'Surabaya'. *Plant Tissue Cult. & Biotech*. 25: 193-205.

Beaujean, A., Sangwan, R.S., Hodges, M., Sangwan-Norreel, B.S. 1998. Effect of ploidy and homoozygosity on transgene expression in primary tobacco transformants and their androgenetic progenis. *Mol Gen Genet*. 260(4): 362-371.

Belmonte, M., Elhiti, M., Waldner, B., Stasolla, C. 2010. Depletion of cellular brassinolide decreases embryo production and disrupts the architecture of the apical meristems in *Brassica napus* microspore-derived embryos. *J Exp Bot*. 61: 2779–2794.

Belyaeva B, O., Litvin, F.F. 2007. Photoactive pigment-enzyme complexes of chlorophyll precursor-enzyme complexes of chlorophyll precursor in plant leaves. *Bichemistry (Moscow)*. 72 (13): 1458-77.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Bercu, R., Bavaru, A., Broască, L. 2011. Anatomical aspects of *Phalaenopsis amabilis* (L.) Blume.

Bhattacharyya, P., Kumaria, S., Job, N., Tandon, P. 2016. *En-masse* production of elite clones of *Dendrobium crepidatum*: A threated, medicinal orchid used in Traditional Chinese Medicine. *J Appl Res Med Aromat Plants*. 3: 186-176.

Borghi, L. Inducible gene expression system for plants. 2010. *In* L. Hennig., C. Köhler (eds). *Methods Mol Biol*. Springer Science+Bussines media, LLC. pp. 65-75.

Boutilier, K. 2002. Ectopic expression of BABY BOOM triggers a conversion from vegetative to embryonic growth. *Plant Cell*. 14: 1737-1749.

Bratzel, F., Lopez-Torrejon, G., Koch, M., Del Pozo, J.C., Calonje, M. 2010. Keeping cell identity in Arabidopsis requires PRC1 RING-funger homologs that catalzes H2A monoubiquitination. *Curr Biol*. 20: 1853-1859.

Breuninger, H., Rikirsch, E., Hermann, M., Ueda, M., Laux, T. 2008. Differential expression of WOX genes mediates apical-basal axis formation in the Arabidopsis embryo. *Dev Cell*. 14: 867–876.

Bunnag, S. and Pilahome, W. 2012. *Agrobacterium*-mediated transformation of Dendrobium primulinum Lindl. with antisense ACC oxidase. *Acta Hortic*. 829: 283-288.

Capron, A., Chatfield, S., Provart, N., Berleth, T. 2009. Embryogenesis: Pattern formation from a single cell. *Arabidopsis book*. 7: e0126.

Chai, J., Liu, X., Vanneste, K., Proost, S., Tsai, W-C., Liu, K-W., Chen, L-J., He, Y., Xu, Q., Bian, C., Zheng, Z., Sun, F., Liu, W., Hsiao, Y-Y., Pan, Z-J., Hsu, C-C., Yang, Y-P., Hsu, Y-C., Chuang, Y-C., Dievart, A., Dufayard, J-F., Xu, X., Wang, J-Y., Wang, J., Xiao, X-J., Zhao, X-M., Du, R., Zhang, G-Q., Wang, M., Su, Y-Y., Xie, G-C., Liu, G-H., Li, L-Q., Huang, L-Q., Luo, Y-B., Chen, H-H, de Peer, Y.V. 2015. The genome sequence of the orchid *Phalaenopsis equistris*. *Nat Genet*. 47: 65-72.

Chardin, C., Girin, T., Roudler, F., Meyer, C., Krapp, A. 2014. The plant RWP-RK transcription factors: key regulators of nitrogen responses and of gametophyte development. *J Exp Bot*. 65: 5577-5587.

Che, P., Lall, S., Nettleton, D., Howell, S.H. 2005. Gene expression programs during shoot, root, and callus development in Arabidopsis tissue culture. *Plant Physiology*. 141: 620-637.

Chen, F., Bradford, K.J. 2000. Expression of an expansin is assocated with endosperm weakening during tomato seed germination. *Plant Physiol*. 124: 1265-74.

Chen, Jen-Tsung. dan Chang, Wei-Chin. 2006. Direct somatic embryogenesis and plant regeneration from leaf explants of *Phalaenopsis amabilis*. *Biol Plant*. 50: 169-173.

_____and_____. 2004. Induction of repetitive embryogenesis from seed-derived protocorms of *Phalaenopsis* amabilis var. Formosa Shimadzu.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Chen, D., Molitor, A., Liu, C., Shen, W.H. 2010. The Arabidopsis PRC1-like finger proteins are necessary for repression of embryonic traits during vegetative growth. *Cell Res*. 20: 1332-1344.

Chen, W.H., Hsu, C.Y., Cheng, H.Y., Chang, H., Chen, H.H., Ger, M.J. 2011. Downregulation of putative UDP-glucose: flavonoid 3-O glucosyltransferase gene alters flower coloring in *Phalaenopsis*. *Plant Cell Rep*. 30: 1007–1017.

Chen, Y.C., Yang, Y.C., Chen, Y.H., Chao, Y.P., Chang, L.Z., Chen, Y.W. 2010. Modification of *Phalaenopsis* metabolism by genetic engineering. *Acta Hort*. 878 :473–480.

Chen, P.L., Hong, P.L. 2012. Cellular origin and development of secondary somatic embryos in Oncidium leaf cultures. *Biol Plant*. 56: 215-220.

Chen, Z., Cheng, Q., Hu, C., Gou, X., Chen, Z., Lin, Y., Hu, T., Bellizzi, M., Lu, G., Wang, G-L., Wang, Z., Chen, S., Wang, F. 2017. A Chemical-induced, seed-soaking activation procedure for regulated gene expression in rice. *Fron. Plant. Sci*. 8: 1-13.

Chrestensen, C.A., Starke, D.W., Mieyal, J.J. 2000. Acute cadmium exposure inavtivates thioltransferase (Glutaredoxin), inhibits intracellular reduction of protein-glutathionyl-mixed disulfides, and initiates apoptosis. *J Bio Chem*. 275: 26556-65.

Christenson, A.E. 2001. *Phalaenopsis*: a monograph. Timber Press Inc. Portland, Oregon, New York.

Christenhusz, M.J.M. dan Byng, J.W. 2016. The number of known plants species in the world and its annual increase. *Phytotaxa*. 261: 201–217.

Chugh, A., Kurana, P. 2002. Gene expression during somatic embryogenesis-Recent advances. *Current Science*. 83(6): 715-730.

Chugh, S., Guha, S., Rao, I.U. 2009. Micropropagation of orchids: A review on the potential of different explants. *Sci Hortic*. 122: 507-520.

Chumakov, M.I. 2013. Protein apparatus for horizontal transfer of agrobacterial T-DNA to eukaryotic cells. *Biochemistry*. 78 :1321–1332.

Claus, K., von Roepenack-Lahaye, E., Bottcher, C., Roth, M.R., Welti, R., Erban, A., Kopka, J., Scheel, D., Milkowski, C., Strack, D. 2011. Overexpression of Sinapine Esterase *BnSCE3* in oilseed rape seeds triggers global changes in seed metabolism. *Plant Physiology*. 155:1127-45.

Comber, J.B. 1990. Orchids of Java. London: Bentham-moxon Trust. The Royal Botanic Gardens, Kew.

Cortes, M.M., Paredes, F.R., Burgeff, C., Nunez, T.P., Cordova, I., Oropeza, C., Verdeil, J.L., Saenz, L. 2010. Characterisation of a cyclin-dependent kinase (CDKA) gene expressed during somatic embryogenesis of coconut palm. *Plant Cell Tissue Organ Cult*. 102: 251–258.

Cueva, A., Concia, L., Cella, R. 2012. Molecular characterization of a *Cyrtochilum loxense* Somatic Embryogenesis Receptor-like Kinase (SERK) gene expressed during somatic embryogenesis. *Plant Cell Rep*. 31: 1129-1139.

Cueva-Agila, A.Y., Medina, J., Concia,L., Cella, R. 2016. Effects of plant growth regulator, auxin polar inhibitors on somatic embryogenesis and *CmSERK*

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

gene expression in *Cattleya maxima* (Lindl.). *In* A. Mujib (Ed). *Somatic embryogenesis in ornamentals and its applications*. Vol. 1. Spinger. India.

Curtis, M. D., Grossniklaus, U. 2003. A gateway cloning vector set for high-throughput functional analysis of genes in planta. *Plant Physiology*. 133: 462-169.

David, D., Jawan, R., Marwabi, H., Gansau, J.A. 2015. Organic additives improves the *in vitro* growth of native orchid *Vanda helvova* Blume. *Not. Sci. Biol*, 7(2): 192-197.

de Almeida, M. de Almeida, C.V., Mendes, G.E., Ebling, B.G., Fiori de Abreu-Tarazi, M. 2012. Pre-procambial cells are niches for pluripotent and totipotent stem-like cells for organogenesis and somatic embryogenesis in the peach palm: a histological study. *Plant Cell Rep*. 31: 1495-1515.

De Rybel, B., Moller, B., Yoshida, S., Grabowicz, I., Barbier de Reuille, P, Boeren, S., Smith, R.S., Borst, J.W., Weijers, D. 2013. A bHLH complex controls embryonic vascular tissue establishment and indeterminate growth in Arabidopsis. *Dev Cell*. 24: 426–437.

de Smet, I. dan Beeckman, T. 2011. Asymmetric cell division in land plants and algae: the driving force for differentiation. *Nat Rev Mol Cell Biol*. 12: 177-188.

De Vries, S.C. dan Weijers, D. 2017. Plant embryogenesis. *Curr Biol*. 11: 27(17).

Decruse, S.W., Gangaprasad, A., Seeni, S., Menon, V.S. 2003. Micropropagation and ecorestoration of *Vanda spathulata*, an exquisite orchid. *Plant Cell, Tissue and Organ Culture*. 72(2): 199-202.

Departemen Pertanian Indonesia. 2015. *Prospek Dan Arah Pengembangan Agribisnis Anggrek*. Badan Penelitian dan Pengembangan Pertanian. Departemen Pertanian.

Deo, P., Thagi, A, P., Talor, M., Harding, R., Becker, D. 2010. Factors affecting somatic embryogenesis and transformation in modern plant breeding. *The South Pacific Journal of Natural Science*. 28(1): 27-40.

Ding, L., Wanf, Y., Yu, H. 2013. Overexpression of DOSOC1, an ortholog of Arabidopsis SOC1, promotes flowering in the orchid *Dendrobium* Chao Parya Smile. Plant *Cell Physiol*. 54: 595-608.

Dohling, S., Das, M.C., Kumaria, S., Tandon, P. 2007. Conservation of splendid orchids of North-East India. pp. 354–365. *In* P. Tandon, Y.P. Abrol, S. Kumaria (eds). *Biodiversity and its significance*. International Publishers. New Delhi.

Dobin, A. *et al.* 2013. 'STAR: ultrafast universal RNA-seq aligner', *Bioinformatics*. Narnia, 29(1): 15–21.

Doung, T.N., Nguyen, N.T., Bui. L.T.K., Vu, Q.L. 2008. Peptone stimulates *in vitro* shoot and root regeneration of avocado (*Persea americana* Mill.) *Scientia Horticulturae*. 115:124-128.

Downes, B.P., Crowell, D.N. 1998. Cytokinin regulates the expression of a soybean β-expansin gene by a post-transcriptional mechanism. *Plant molecular biology*. 37: 437-444.

Dressler, R.L. 1993. Phylogeny and classification of the orchid family. Diocorides Press. Hong Kong.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Dündar, F., Skrabanek, L., Zumbo, P. 2018. Introduction to differential gene expression analysis using RNA-seq. Applied Bioinformatics Core. Weill Cornell Medical College. pp. 1-89.

Elhiti, M., dan Stasolla, C. 2011. Ectopic expression of the Brassica SHOOTMERISTEMLESS attenuates the deleterious effects of the auxin transport inhibitor TIBA on somatic embryo number and morphology. *Plant Sci*. 180: 383–390.

Elhiti, M., Stasolla, C., Wang, Aiming. 2013. Molecular regulation of plant somatic embryogenesis. *In Vitro Cell Dev Biol-Plant*. 49: 631-642.

Elhiti, M., Tahir, M., Gulden, R.H., Khamiss, K., Stasolla, C. 2010. Modulation of embryo-forming capacity in culture through the expression of *Brassica* genes involved in the regulation of the shoot apical meristem. *J Exp Bot*. 62: 4069-4085.

Eveland, A.L., Satoh-Nagasawa, N., Goldsmith, A., Meyer, S., Beatty, M., Sakai, H., Ware, D., Jackson, D. 2010. Digital gene expression signatures for maize development. *Plant Physiol.* 154: 1024-1039.

Fan, Su-Chiung., Chen, Jhun-Chen., Wei, Miao-Ju. 2016. Protocorms and protocorm-like bodies are molecularly distinct from zygotic embryonic tissue in *Phalaenopsis aphrodite*. *Plant Physiol*. 171: 2682-2700.

Farrell, R. 2010. RNA methodologies laboratory guide for isolation and characterization. Elsevier/Academic Press, Amsterdam Boston.

Feng, Jia-Huan. and Chen, Jen-Tsung. 2014. A novel *in vitro* protocol for inducing direct somatic embryogenesis in *Phalaenopsis aphrodite* without taking explants. *Scientific World Journal*. 2014: 1-7.

Feng, Z., Sun, X., Wang, G., Liu, H., Zhu, J. 2012. LBD29 regulates the cell cycle progression in response to auxin during lateral root formation in Arabidopsis thaliana. *Ann Bot*. 160: 2–10.

Ferris, P.J. and Goodenough, U.W. 1997. Mating type in Chlamydomonas is specified by *mid*, the Minus-Dominance gene. *Genetics*. 146: 859-869.

Fujimura, T. and Komamine, A. 1979. Involvement of endogenous auxin in somatic embryogenesis in a carrot cell suspension culture. *Z Pflanzenphysiol*. 95: 13–19.

Gahan, P.B. dan George, E.F. 2008. Adventitious regeneration pp. 355-401. *In* George, E.F., hall., M.A. dan de Klerk, G-J (eds). Plant propagation by tissue culture. Vol 1. Springer. Netherlands.

Gaj, M.D. 2004. Factors influencing somatic embryogenesis induction and plant regeneration with particular reference to *Arabidopsis thaliana* (L.). *Heynh. Plant Growth Regul*. 43: 27–47.

Gantait, S. And Sinniah, U.R. 2012. Rapid micropropagation of monopodial orchid hybrid (*Aranda* Wan Chark Kuan 'Blue' X *Vanda coerulea* Grifft. ex. Lindl.) through direct induction of protocorm-like bodies leaf segments. *Plant Growth Regul*. 68: 129-140.

Gao, J., Lan, T. 2016. Functional characterization of the late embryogenesis abundant (LEA) protein gene family from *Pinus tabuliformis* (Pinaceae) in *Escherichia coli*. *Scientific Reports*. 6: 1-13.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Gatz, C., Lenk. I. 1998. Promoters that respond to chemical inducers. *Trends Plant Sci*. 3:352-358.

Gelvin, S.B. 2003. *Agrobacterium*-mediated plant transformation: the biology behind the "Gene-Jockeying" Tool. *Microbiol Mol Biol Rev*. 67: 16-37.

Gelvin, S.B. 2010. Plant proteins involved in *Agrobacterium*-mediated genetic transformation. *Annu Rev Phytopathol*. 48: 45–68.

Giannakoula, A.E., Ilias, I.F., Maksimović, J.J.D., Maksimović, V, M., Živanović, B.D. 2012. The effects of plant growth regulators on growth, yield, and phenolic profile of lentil plants. *J Food Compost Anal*. 28: 46-53.

Gierliński, M., Cole, C., Schofield, P., Schurch, N.J., Sherstnev, A., Singh, V., Wrobel, N., Gharbi, K., Simpson, G., OwenHughes, T., Blaxter, M., Barton, G.J. 2015. Statistical models for RNA-seq data derived from a two-condition 48-replicate experiment. *Bioinformatics*, 31(22):1–15.

Gnasekaran, P., Anthony, J.J.J., Uddain, J., Sreeramanan, S. *Agrobacterium*-mediated transformation of the recalcitrant *Vanda* Kasem's delight orchid with higher efficiency. *Sci World J*. 1: 1-10.

Golbabapour, S., Majid, N.A., Hassandarvish, P., Hajrezaie, M., Abdulla, M.A., Hadi, A.M.A. 2013. Gene silencing and polycomb group proteins: an overview of their structure, mechanisms and phylogenetics. *OMICS*. 17: 283-296.

Goodwin, S., Mcpherson, J.D., Mccombie, W.R,. 2016. Coming of age: ten years of next- generation sequencing technologies. *Nature Genetics*, 17(6):333–351.

Gow, Peng-Wee., Chen, Jen-Tsung., Chang, Wei-Chin. 2010. Effects of genotype, light regime, explant position and orientation on direct somatic embryogenesis from leaf explants of *Phalaenopsis* orchids. *Acta Physiol Plant*. 31: 363-369.

Griffith, M., Walker, J.R., Spies, N.C., Ainscough, B.J., Griffith, O.L. 2015. Informatics for RNA Sequencing: A Web Resource for Analysis on the Cloud. *PLoS Computational Biology*, 11(8): e1004393.

Guo, B., Abbasi, B.H., Zeb, A., Xu, L.L., Wei, Y.H. 2011. Thidiazuron: A multi-dimensional plant growth regulator. *Afr J Biotechnol*. 10: 8984-9000.

Guo, H.S., Fei, J.F., Xie, Q., Chua, N.H. 2003. A chemical-regulated inducible RNAi system in plants. *Plant J*. 34:383–392.

Gutiérrez-Mora, A., González- Gutiérrez, A.G., Rodríguez-Garay, B., Ascencio-Cabral, A., Li-Wei, L. 2012. Plant somatic embryogenesis: some useful considerations. *In* K.I. Sato (ed). *Embryogenesis*. InTech, Rijeka. pp. 229-248.

Hecht, V., Vielle-Calzada, J.P., Hartog, M.V, Schmidt, E.D.L, Boutilier, K., Grossniklaus, U., De Vries, S.C. 2001. The Arabidopsis SOMATIC EMBRYOGENESIS RECEPTOR KINASE 1 gene is expressed in developing ovules and embryos and enhances embryogenic competence in culture. *Plant Physiol.* 127: 803–816.

Hong, Pou-Ieng., Chen, Jen-Tsung., Chang, Wei-Chin. 2010. Shoot development and plant regeneration from protocorm-like bodies of *Zygopetalum mackayi*. *In Vitro Cell Dev Biol*. 46: 306-311.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Horii, T., Ogawa, T., Ogawa, H. 1981. Nucleotide sequence of the *lexA* gene of *E. coli*. *Cell*. 23: 689-697.

Hossain, M.M., Sharma, M., Pathak, P. 2012. In vitro propagation of Dendrobium aphyllum (Orchidaceae)-seed germination to flowering. *J Plant Biochem Biotechnol*. 22: 157-167.

Hsing, Hong-Xian., Lin, Yi-Jyun., Tong, Chii-Gong., Li, Min-Jeng., Chen, Yun-Jin., Ko, Swee-Suak. 2016. Efficient and Heritable transformation of *Phalaenopsis* orchids. *Bot Stud*. 57: 1-12.

Hardjo, P.H., Binarto, C.W.S., Savitri, W.D. 2016. Induksi protocorm-like bodies (PLBs) *Vanda tricolor* Lindl. var. pallida. *Procceding Seminar Nasional Biodiversitas VI*. Surabaya. 172-179.

Hobbs, S.L., Kpodar, P., DeLong, C.M. 1990. The effect of T-DNA copy number, position and methylation on reporter gene expression in tobacco transformants. *Plant Mol Biol*. 15: 851-864.

Hofmann, F., Schon, M.A., Nodine, M.D. 2019. The embryogenic transcriptome of *Arabidopsis thaliana*. *Plant Reproduction*. 32(1): 77-91.

Horii, T., Ogawa, T., Ogawa, H. 1981. Nucleotide sequence of the *lexA* gene of *E. coli*. *Cell*. 23: 689–697

Hošek, P., Kubeš, M., Laňková, Dobrev, P., Klíma, P., Kohoutová, M., Petrášek, J., Hoyervá., Jiřina, M., Zažimalova, E. 3012. Auzin transport at cellular level: new insight supported by mathematical modelling. *Journal of Experimental Botany*. 63: 3815-3838.

Hsieh, R.M. dan Huang, P.L. 1995. Studies on genetic transformation of *Phalaenopsis* via pollen tube pathway. *J Chin Soc Hort Sci*. 41: 309–324.

Huan, L.V.T., Takamura, T., Tanaka, M. 2004. Callus formation and plant regeneration from callus through somatic embryo structures in *Cymbidium* orchid. *Plant Sci*. 166: 1443-1449.

Ikeuchi, M., Sugimoto, K., Iwase, A. 2013. Plant callus: mechanisms of induction and repression. *Plant Cell*. 25: 3159–3173.

Illumina. RNA-Seq Data Comparison with Gene Expression Microarrays, 2011. URL:http://www.europeanpharmaceuticalreview.com/wp.content/uploads/Illumina_whitepaper.pdf. Diakses pada 24 April 2019.

Ishige, F., Takaichi, M., Foster, R., Chua, N., Oeda, K. 1999. A G-box motif (GCCACGTGCC) tetramer confers high-level constitutive expression in dicot and monocot plants. *Plant J*. 18: 443–448.

Islam, M.O., Ichihashi, S., Matsui, S. 1998. Control of growth and development of protocorm like body derived from callus by carbon sources in *Phalaenopsis*. *Plant Biotechnol*. 15: 183-187.

Islam, S.M. dan Bhattacharjee, B. 2015. Plant regeneration through somatic embryogenesis from leaf and root explants of *Rhynchostylis retusa* (L.) Blume. *Applied Biological Research*. 17: 158-165.

Isnaeni, Y. 2015. Diseminasi hasil penelitian dan pengembangan tanaman anggrek dan kantong semar di Kebun Raya Bogor. *Pros Sem Nas Masy Biodiv Indon*. 1: 1884-89.

Iwase, A., Mitsuda, N., Koyama, T., Hiratsu, K., Kojima, M., Arai, T., Inoue, Y., Seki, M., Sakakibara, H., Sugimoto, K., Ohme-Takagi, M. 2011. The

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

AP2/ERF transcription factor WIND1 controls cell dedifferentiation in Arabidopsis. *Current Biology*. 21(16): 508-514.

Jacq, A., Pernot, C., Martinez, Y., Domergue, F., Payre, B., Jamet, E., Burlat, V., Pacquit, V.B. 2017. The Arabidopsis lipid transfer protein 2 (AtLTP2) is involved in cuticle-cell wall interface integrity and in etiolated hypocotyl permeability. *Frontiers in Plant Science*. 8: 263.

Jainol, J.E. and Gansau, J.A. 2017. Embryonic callus induction from leaf tip explants and protocorm-like body formation and shoot proliferation of *Dimorphorchis Iowii*: Borneon endemic orchid. *AGRIVITA*. 39: 1-10.

Jameson, P. E. dan Song, J. Cytokinin: a key driver of seed yield. *J Exp Bot*. 67: 593-606.

Jayanthi, M., Mohan, M.N., Mandal, P.K. 2011. Direct somatic embryogenesis and plantlet regeneration in oil palm. *J Plant Biochem*. 20: 249-251.

Jeong, S., Palmer, T.M., Lukowitz, W. 2011. The RWP-RK factor GROUNDED promotes embryonic polarity by facilitating YODA MAP kinase signaling. *Curr Biol*. 21: 1268–1276.

Jiang, Y., Chen, R., Dong, J., Xu, Z., Gao, X. 2012. Analysis of GDSL lipase (GLIP) family genes in rice (*Oryza sativa*). *Plant Omics Journal*. 5(4): 351-358.

Jimenéz, V.M. and Thomas, C. 2005. Participation of plant hormones in determination and progression of somatic embryogenesis. *In* A. Mujib and J. Šamaj. *Somatic Embryogenesis*. Springer-Verlag. Berlin Heidelberg. pp. 104-118.

Jin, F.Y., Hu, L.S., Yuan, D.J, Xu, J., Gao, W.H., He, L.R., Yang, X.Y., Zhang, X.L. 2013. Comparative transcriptome analysis between somatic embryos (SEs) and zygotic embryos in cotton: evidence for stress response functions in SE development. *Plant Biotech J* 12:161–173.

Johansen, D.A. 1950. Plant embryology. Chronica Botanica, Waltham.

Jolivet, P., Roux, E., d'Andrea, S., Davanture, M., Negroni, L., Zivy, M., and Chardot, T. 2004. Protein composition of oilbodies in Arabidopsis thaliana ecotype WS. *Plant Physiol. Biochem*. 42:501–509.

Julkife, A.L., Samian, R., Poobathy, R., Subramanian, S. 2012. Chemotactic movement and bacterial attachment of *Agrobacterium tumefaciens* towards protocorm-like bodies (PLBs) of *Dendrobium* sonia-28. *Aust J Crop Sci*. 6: 1181-1191.

Kai, K., Nakamura, S., Wakasa, K., Miyagawa, H. 2007. Facile preparation of deuterium-labeled indole-3-acetic acid (IAA) and its metabolites to quantitatively analyze the disposition of exogenous IAA in Arabidopsis thaliana. *Bioscience Biotechnology and Biochemistry*. 71: 1946–1954

Kaewubon, P. and Meesawat, U. 2016. Histological examination of callogenesis in bisected protocorm culture of pigeon orchid (*Dendrobium crumenatum* Swartz). *Walailak J Sci & Tech*. 13: 749-756.

Kang, H., Fang, Y., Singh, K.B. 1999. A glucocorticoid-inducible transcription system causes severe growth defects in *Arabidopsis* and induces defense-related genes. *Plant J*. 20: 127-133.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Kasi, P.D. dan Semiarti, E. 2016. Pengaruh *thidiazuron* dan *napthalene acetic acid* untuk induksi embriogenesis somatik dari daun anggrek *Phalaenopsis* "*Sogo Vivien*". *Jurnal Dinamika*. 7: 31-40.

Kasahara, H. 2015. Current aspects of auxin biosynthesis in plants. *Biosci Biotechnol Biochem*. 80: 34-42.

Karami, O., Behzad, A., Pour, A.M. 2009. Molecular aspects of somatic-to-embryogenic transition in plants. *J Chem Biol*. 2: 177-190.

Kaur, S., Bhutani, K.K. 2016. Asymbiotic seed germination and multiplication of an endangered orchid *Phapiopedilum venustum* (Wall. Ex Sims.). *Acta Societatis Botanicorum Poloniae*. 85(2):1-11.

Kerbauy, G.B. 1984. Plant regeneration of *Oncidium varicosum* (Orchidaceae) by means of root tip culture. *Plant Cell Rep*. 3: 27-29.

Khoddamzadeh, A.A., Sinniah, U.R., Kadir, M.A., Kadzimin, S.B., Mahmood, M., Sreeramanan, S. 2011. In vitro induction and proliferation of protocorm-like bodies (PLBs) from leaf segments of *Phalaenopsis bellina* (Rchb.f.) Christenson. *Plant Growth Regul*. 65: 381-387.

Kim, D.H., Kang, K.W., Sivanesan, I. 2019. Influence of auxins on somatic embryogenesis in *Haworthia retusa* Duval. *Biologia*. 74: 25-33.

Kou, Y., Yuan, C., Zhao, Q., Liu, G., Nie, J., Ma, Z., Cheng, C., Teixeira da Silva, J.A., Zhao, Liangjun. 2016. Thidiazuron triggers morphogenesis in *Rosa canina* L. protocorm-like bodies by changing incipient cell fate. *Front Plant Sci*. 7: 1-13.

Krenek, P., Samajova, O., Luptovciak, I., Doskocilova, A., Komis, G., Samaj, J. 2015. Transient plant transformation mediated by *Agrobacterium tumefaciens*: Principles, methods and applications. *Biotechnol Adv*. 33: 1024-1042.

Kőszegi, D., Johnston, A.J., Rutten, T., Chizal, A., Altschmeied., Kumlehn, J., Wüst, S.E.J., Kirioukhova, O., Gheyselinck, J., Grossniklaus, U., Bäumlein, H. 2011. Members of the RKD transcription factor family induce an egg cell-like gene expression program. *Plant J*. 67: 280–291.

Kubo, M., Imai, A., Nishiyama, T., Ishikawa, M., Sato, Y., Kurata, T., Yuji, H., Reski, R., hasebe, M. 2013. System for stable β-Estradiol-Inducible gene expression in the moss *Physcomitrella patens*. *Plos One*. 8(9):e77356.

Kuo, J. L., Chen, J.T., Chang, W.C. 2005. Efficient plant regeneration through direct somatic embryogenesis from leaf explants of *Phalaenopsis* 'Little Steve'. *In Vitro Cell Dev Biol Plant*. 41: 453-456.

Kurczyńska, E.U., Potocka, I., Dobrowolska, I., Kulinska-Lukaszek., Sala, K., Wrobel J. 2012. Cellular Markers for Somatic Embryogenesis. *In*: Sato, K-I (ed) Embryogenesis. InTech, Rijeka—Croatia, pp. 307–332 .

Latif, S.M. 1953. *Bunga anggerik*. N. V. Penerbitan W. Van Hoeve-Bandung s'-Gravenhage.

Ledwon, A. and Gaj, M.D. 2009. LEAFY COTYLEDON2 gene expression and auxin treatment in relation to embryogenic capacity of *Arabidopsis* somatic cells. *Plant Cell Rep*. 28: 1677-1688.

Lee, Y., Choi, D., Kende, H. 2001. Expansins: ever-expanding numbers and functions. *Current Opinion in Plant Biology*. 4:527-532.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Lee-Y-I., Yeunng, E.C., Lee, N., Chung, M-C. 2008. Embryology of *Phalaenopsis amabilis* var. formosa: embryo development. *Bot Stud*. 49: 139-146.

Lee, L-Y. dan Gelvin, S.B. 2008. T-DNA binary vector and systems. *Plant Physiol*. 146: 325-332.

Lee, Y-I., Hsu, S-T., Yeung, E.C. 2013. Orchid protocorm-like bodies are somatic embryos. *Am J Bot*. 100: 2121–31.

Leljak-Levanić, D., Mihaljević dan Bauer, N. 2015. Somatic and zygotic embryos share common developmental features at the onset of plant embryogenesis. *Acta Physiol Plant*. 37: 127.

Levin, J.Z., Yassour, M., Adiconis, X., Nusbaum, C., Thompson, D.A., Friedman, N, Gnirke, A., Regev, A. 2010. Comprehensive comparative analysis of strand-specific RNA sequencing methods. *Nature Methods*, **7**(9):709–715.

Li, Zhi-Ying. and Xu, L. 2009. In vitro propagation of white-flower mutant of *Rhynchostylis gigantea* (Lindl.) Ridl. Through immature seed-derived protocorm-like bodies. *J Hortic For*. 1: 093-097.

Li, X., Fan, J., Gruber, J., Guan, R., Frentzen, M., Zhu, L-H. 2013. Efficient selection and evaluation of transgenic lines of *Crambe abyssinica*. *Frontiers Plant Science*. 4: 162.

Li, Y., Xiao, X., Ji, X., Liu, B., Amos, C.I. RNA-seq analysis of lung adenocarcinomas reveals different gene expression profiles between smoking and non-smoking patients. *Tumour Biol*. 36(11): 8993-9003.

Liao, Yu-Ju., Tsai, Yu-Ching., Sun, Yung-Wei., Lin, Ruey-Song., Wu, Fang-Sheng. 2011. In vitro shoot induction and plant regenerations from flower bunds in *Paphiodilum* orchids. *In Vitro Cell. Dev. Biol.-Plant*. 47: 702-709.

Ling, H., Zhao, J., Zuo, K., Qiu, C., Yao, H., Qin, J., Sun, X., Tang, K. 2006. Isolation and expression analysis of a GDSL-like lipase gene from *Brassica napus* L. *J Biochem Mol Biol*. 39: 297-303.

Ling, H., Zeng, X., Guo, S. 2016. Functional insights into the late embryogenesis abundant (LEA) protein family from *Dendrobium officinale* (Orchidaceae) using an *Escherichia coli* system. *Scientific Reports*. 6: 39693.

Lisnandar, D.S., Mudyantini, Pitiyo, A. 2012. Pengaruh pemberian konsentrasi NAA (α-napthaleneacetic acid) dan 2.4 D terhadap induksi protocorm like bodies (PLB) anggrek macan (*Grammatophyllum scriptum* (Lindl.). *Bioteknologi*. 9: 66-72.

Liu, C.M., Xu, Z.H., Chua, N.H. 1993. Auxin polar transport is essential for the establishment of bilateral symmetry during early plant embryogenesis. *Plant Cell*. 5: 621-630.

Liu, H.I., Wang, G.C., Feng, Z., Zhu, J. 2010. Screening of genes associated with dedifferentiation and effect of LBD29 on pericycle cells in Arabidopsis thaliana. *Plant Growth Regul*. 62: 127–136.

Liu, Zin-Huang., Wang, Wei-Chang., Yen, Yan-Sin. 1998. Effect of hormone treatment on root formation and endogenous indole-3-acetic acid and polyamine levels of *Glycine max* cultivated *in vitro*. *Bot Bull Acad Sin*. 39: 113-118.

Love, M. I., Huber, W. and Anders, S. 2014. Moderated estimation of fold change

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur
Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

and dispersion for RNA-seq data with DESeq2. *Genome Biology*. *BioMed Central*. 15(12), p. 550.

Luo, M., Taylor, J.M., Spriggs, A., Zhang, H., Wu, X., *et al*. 2011. A genome-wide survey of imprinted genes in rice seeds reveals imprinting primarily occurs in the endosperm. *PLoS Genet* 7: e1002125

Mahendran, G. dan Bai, V.N. 2016. Direct somatic embryogenesis of *Malaxis densiflora* (A. Rich.) Kuntze. *JGEB*. 14: 77-81.

Mahendran, V. dan Bai, N. 2012. Direct somatic embryogenenesis and plant regeneration from seed derived protocorms of *Cymbidium bicolor* Lindl. *Sci Hort*. 135: 40-44.

Mayer, J.L.S., Stancato, G.C., Appezzato-Da-Glória. Direct regeneration of protocorm-like bodies (PLBs) from leaf apices of *Oncidium flexuosum* Sims (Orchidaceae). 2010. *Plant Cell Tiss Organ Cult.* 103: 411-416.

Meilasari, D. and Iriawati. 2016. Regeneration of plantlets through PLB (Protocorm-Like Body) formation in Phalaenopsis 'Join Angle X Sogo Musadian'. *J Math Fund Sci*. 48: 204-212.

Mello-Farias, P.C. dan Chaves, A.L.S. Advances in *Agrobacterium*-mediated plant transformation with enphasys on soybean. *Sci Agric*. 65: 95-106.

Meng, Z-H., Liang, A., Yang, W. 2007. Effects of hygromycin on cotton cultures and its application in Agrobacterium-mediated cotton transformation. *In Vitro Cellular & Developmental Biology – Plant*. 43(2): 111-118.

Merzylak, E.M., Goedhart, J., Shcherbo, D., Bulina, M.E., Shcheglov, A.S., Fradkov, A.F., Gaintzeva, A., Lukyanov, K.A., Lukyanov, S., Gadella, T.W., Chudakov, D.M. 2007. Bright monomeric red fluorescent protein with an extended fluorescence lifetime. *Nat Methods*. 4(7):555-7.

Middleton, P. H., Jakab, J., Penmesta, R.V., Starker, C.G., Doll, J., Kaló, P., Prabhutra, R.M., Kereszt, A., Dudas, B., VandenBosch, K., Long, S.R., Cook, D.R., Kiss G.B., Oldroyd, G.E. 2007. An ERF transcription factor in *Medicago truncatula* that is essential for nod factor signal transduction. *Plant Cell*. 19: 1221-1234.

Mii, M., Chin, D.P. 2010. Genetic transformation of orchids. *Acta Hort*. 878: 461–466.

Miki, T., Ebina, Y., Kishi, F., Nakazawa, A. 1981. Organization of the lexA gene of *Escherichia coli* and nucleotide sequence of the regulatory region. *Nucleic Acids Res*. 9:529-543.

Mishiba, K.I., Chin, D.P., Mii, M. 2005. Agrobacterium-mediated transformation of *Phalaenopsis* by targeting protocorms ar an early stage after germination. *Plant Cell Rep*. 24: 297-303.

Mok, W.Y. 1982. Nature and identification of *Exophiala werneckii*. *J Clin Microbiol*. 16: 1982, p. 976.

Molitor, A.M., Bu, Z., Yu, Y., Shen, W.H. 2014. Arabidopsis AL PHD PRC1 complexes promote seed germination through H3K4me3-to-H3K27me3 chromatin state switch in repression of seed developmental genes. *Plos Genetics*. 10: e1004091.

Moncalean, P., Lopez-Iglesias, C., Fernandez, B., Rodriguez, A. 2001. Immunocytochemical location of endogenous cytokinins in buds of kiwi

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

fruit (*Actinidia deliciosa*) during the first hours of *in vitro* culture. *Histochem J*. 33: 403-411.

Moradi, S., Daylami, S.D., Arab, M., Vahdati, K. 2017. Direct somatic embryogenesis in *Epipactis veratrifolia*, a temperate terrestrial orchid. *J Hortic Sci Biotechnol*. 92: 88-97.

Mueller-Fharnow, A., Egner, U. 1999. Ligand-binding domain of estrogen receoptor. *Curr. Opin. Biotechnol*. 10:5505-56.

Muhlenhoff, U., Gerber, J., Nadine, R., Lill, R. 2003. Components involved in assembly and dislocation of iron-sulfur clusters on the scaffold protein Isu1p. *EMBO Journal*. 22(18): 4815-25.

Mujib, A., Ali, M., Tonk, D., Isah, T., Zafar, N. 2016. Embryogenesis in ornamental monocots: Plant growth regulator as signalling elements. pp. 187-201. *In* A. Mujib (ed). *Somatic embryogenesis in ornamentals and its application*. Springer. India.

Mursyanti, E., Purwantoro, A., Moeljopawiro, A., Semiarti, E. 2015. Induction of somatic embryogenesis through overexpression of *AtRKD4* genes in *Phalaenopsis* "Sogo Vivien". *IJB*. 20: 42-53.

Musielak, T.J. and Bayer, M. 2014. YODA signalling in the early *Arabidopsis* embryo. *Biochem Soc Trans*. 42: 408-412.

Nambara, E., Hayama, R., Tsuchiya, Y., Nishimura, M., Kawaide, H., Kamiya, Y., Naito, S. 2000. The role of *ABI3* and *FUS3* loci in *Arabidopsis thaliana* on phase transisition from late embryo development to germination. *Developmental Biology*. 220:412-423.

Narusaka, M., Shiraishi, T., Iwabuchi, M., Narusaka, Y. 2010. The floral inoculating protocol: a simplified *Arabidopsis thaliana* transformation method modified from floral dipping. *Plant Biotechnology*. 27: 349-351.

Nasib, A., Ali, K., Khan, S. 2008. In vitro propagation of Croton (*Codiaeum variegatum*). *Pak. J. Bot*. 40(1): 99-104

Nawy, T., Bayer, M., Mravec, J., Friml, J., Birnbaum, K.D., Lukowitz, W. 2010. The GATA factor HANABA TARANU is required to position the proembryo boundary in the early Arabidopsis embryo. *Dev Cell*. 19: 103–113.

Nic-Can, G.I., Loyola-Vargas, V.M. 2016. The role of the auxins during somatic embryogenesis. In Loyola-Vargas, V.M., and Ochoa-Alejo, N. (eds), *Somatic Embryogenesis: Fundamental Aspects and Applications*. Springer International Publishing Switzerland.

Nieuwland, J., Feron, R., Huisman, B.A.H., Fasolino, A., Hilbers, C.W., Derksen, J., Mariani, C. 2005. Lipid transfer proteins enhance cell wall exrension in tobacco. *Plant Cell*. 17: 2009-19.

Nikmah, Z.C., Slamet, W., Kristanto, B.A. 2017. Aplikasi silika dan NAA terhadap pertumbuhan anggrek bulan (*Phalaenopsis amabilis* l.) pada tahap aklimatisasi. *J Agro Complex*. 1: 101-110.

Niknejad, A., Kadir, M.A., Kadzimin, S.B. 2011. In vitro plant regeneration from protocorms-like bodies (PLBs) and callus of *Phalaenopsis gigantea* (Epidendroideae: Orchidaceae). *Afr J Biotechnol*. 10: 11808-11808.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Ng, C-Y., Saleh, N.M., Zaman, F.Q., 2010. *In vitro* multiplication of the rare endangered slipper orchid, *Phaphiopedilum rothschildianum* (Orchidaceae). *African Journal of Biotechnology*. 9(14):2062-68.

Nookaew, I., Papini, M., Pornputtapong, N., Scalcinati, G., Fagerberg, L., Uhlen, M., Nielsen J. 2012. A comprehensive comparison of RNA-seq-based transcriptomi analysis from reads to differential gene expression and cross-comparison with microarrays: a case study in *Saccharomyces cerevisiae*. *Nucleic Acids research*. 40(20): 10084-97.

Novak, S.D., Luna, L.J., Gamage, R.N. 2014. Role of auxin in orchid development. *Plant Signal Behav*. 9: 10, e972277.

Nuccio, M dan Thomas, T.L. 1999. ATS1 and ATS3: Two novel embryo-specific genes in *Arabidopsis thaliana*. *Plant Molecular Biology*. 39)6):1153-63.

NuGEN. Detection of Genomic DNA in Human RNA Samples for RNA-Seq, 2013. URL http://www.nugen.com/sites/default/files/M01355_v1-TechnicalReport,DetectionofGenomicDNAinHumanRNASamplesforRNA-Seq.pdf. Diakses pada 5 Juni 2019.

Okuzaki, A., Konagaya, K., Nanasato, Y., Tsuda, M., and Tabei, Y. 2011. Estrogeninducible GFP expression patterns in rice (*Oryza sativa* L.). *Plant Cell Rep*. 30:529–538.

Ogawa, Y., Mii, M. 2005. Evaluation of 12 β-lactam antibiotics for Agrobacterium-mediated transformation through in planta antibacterial activities andphytotoxicities. *Plant Cell Rep*. 23:736-743.

Opitz, L., Salinas-Riester, G., Grade, M., Jung, K., Jo, P., Emons, G., Ghadimi, B.M., Beissbarth, T., Gaedcke, J. 2010. Impact of RNA degradation on gene expression profiling. *BMC Med Genet*. 3: 36.

Ooi, S.E., Choo, C.N., Ishak, Z. 2012. A candidate auxin-responsive expression marker gene, *EgIAA9*, for somatic embryogenesis in oil palm (*Elaeis guineensis* Jacq.). *Plant Cell Tiss Org* 110: 201–212.

Ouwerkerk, B.F., de Kam, R.L., Hoge, J.H.C., Meijer, H.A. 2001. Glucocorticoid-inducible gene expression in rice. *Planta*. 213: 370-378.

Ozdolak F., Kapranov, P., Foissac, S., S.W, Kim., Fishilevich, E., Monaghan, A.O., John, B., Milos, P.M. 2010. Comprehensive polyadenylation site maps in yeat and human reveal prervasive alternative polyadenylation. *Cell*. 143(6):1018-29.

Palovaara, J., Hallberg, H., Stasolla, C., Luit, B., Hakman, I. 2010. Expression of gymnosperm PIN homologous gene correlates with auxin immunilocalozation pattern at cotyledon formation and in demarcation of the procambium during *Picea abies* somatic embryo development and in seedling tissues. *Tree Physiol*. 30: 479-489.

Păcurar, D.I., Thordal-Christensen, H., Păcurar, M.L., Pamfil, D. Botez, C., Bellini, C. 2011. *Agrobacterium tumefaciens*: From crown gall tumors to genetic transformation. *Physiol Mol Plant Pathol*. 76: 76-81.

Padidam, M. 2003 Chemically regulated gene expression in plants. *Curr Opin Plant Biol* 6:169–177.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur
Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Pagnussat, L., Burbach, C., Baluska, F. de la Canal, L. 2012. An extracellular lipid transfer protein is relocalized intracellularly during seed germination. *J Exp Bot*. 63: 6555-63.

Panaia, M., Senaratna, T., Dixon, K.W., Sivasithamparam, K. 2004. The role of cytokinins and thidiazuron in the stimulation of somatic embryogenesis in key members of the Restionaceae. *Australian Journal of Botany*. 52(2): 257-265.

Pasternak, T.P., Prinsen, E., Ayaydin, F., Miskolczi, P., Potters, G., Asard, H., Van Onckelen H.A., Dudits, D., Fehe´r, A. 2002. The role of auxin, pH, and stress in the activation of embryogenic cell division in leaf protoplast-derived cells of alfalfa. *Plant Physiology*. 129: 1807–1819.

Park, S.Y., Murthy, H.N., Paek, K.Y. 2003. Protocorm-like body induction and subsequent plant regeneration from shoot tip cultures of *Doritaenopsis*. *Plant Sci*. 164: 919-923.

Park, H.Y., Suh, G.Y., Song, J.U., Yoo, H., Jo, I.J., Shin, T.G., et al. 2012. Early initiation of low-dose corticosteroid therapy in the management of septic shock: a retrospective observational study. *Critical Care*. 16:R3.

Piria, S., Rajmohan, K., Suresh, S. 2008. In vitro production of protocorms and protocorm like bodies in orchids-A review. *Agr Rev*. 29: 40-47.

Pornchuti, W., Thammasiri, K., Chuenboonngarm, N., Panvisavas, N. 2017. Micropropagation of *Spathoglottis eburnea* Gagnep, a Thai orchid species, through shoot tips. *Acta Hortic*. 1167: 87-94.

Prols, F., Meyer, P. 1992. The methylation patters of chromosomal integration regions influence gene activity of transferred DNA in Petunia hybrid. *Plant Journal*. 2: 465-475.

Puspaningtyas, D.M. 2010. Koleksi anggrek Kebun Raya Bogor. LIPI. Bogor. pp 72.

Puspasari, R.R., Rosyidi, I.N., Ningrum, E.F.C., Semiarti, E. 2018. Pengaruh pepton terhadap pertumbuhan embrio anggrek *Vanda tricolor* Lindley var. Suavis asal Merapi secara *in vitro*. *Scripta Biologica*. 5(1): 47-50.

Qin, X.Y., Liu, Y., Mao, S.J., Li, T.B., Wu, H.K., Chu, C.C., Wang, Y.P. 2011. Genetic transformation of lipid transfer protein encoding gene in Phalaenopsis amabilis to enhance cold resistance. *Euphytica*. 177: 33–43.

Quiroz-Figueroa, F.R., Rojas-Herrera, R., Galaz-Avalos, R.M., Loyola-Vargas, V.M. 2006. Embryo production through somatic embryogenesis can be used to study cell differentiation in plants. *Plant Cell Tiss Org*. 86: 285-301.

Rachmawati, F., Purwito, A., Wiendi, N.M.A., Mattjik, N.A., Winarto, B. 2014. *In vitro* mass propagation of *Dendrobium* Gradita 10 orchids via somatic embryogenesis. *J Hort*. 24: 196-209.

Radoeva, T. and Weijers. 2014. A roadmap to embryo identity in plants. *Trends Plant Sci*. 19: 709-716.

Rahardi, F. 1997. Album tanaman hias Trubus. Seri 32. Penerbit Surabaya.

Rasmussen, H. N. 1990. Cell diferentiation and mycorrhizal infection in *Dactylorhiza majalis* (Rchb. F.) Hunt & Summerh. (Orchidaceae) during germination in vitro. *New Phytol* 116: 137–143

UNIVERSITAS GADJAH MADA
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Restanto, D.P., Santoso, B., Kriswanto, B., Supardjono, S. 2016. The application of chitosan for protocorm like bodies (PLB) induction of orchid (*Dendrobium sp*) *in vitro*. *Agriculture and Agricultural Science Procedia*. 9: 462-468.

Reza, S.H., Delhomme, N., Street N.R., Ramachadran, P., Dalman, K., Nilsson, O., Minina, E.A., Bozhkov, P.V. 2018. Transcriptome analysis of embryonic domains in Norway Spruce reveals potential regulators of suspensors of suspensor cell death. *Plos One*. 13(3): e0192945.

Rocha, D.I., Kurczyńska, E., Potocka, I., Steinmacher, D.A., Otoni, W.C. 2016. Histology and histochemistry of somatic embryogenesis. pp. 471-494. *In* V.M. Loyola-Vargas dan Ochoa-Alejo (eds). *Somatic Embryogenesis: Fundamental Aspects and Applications*. Vol. 1. Springer International Publishing. Switzerland.

Rodriguez-Manzaneque, M.T., Ros, J., Cabiscol, E., Sorribas, A., Herrero, E. 2000. Grx5 glutaredoxin plays a central role in protection against protein oxidative damage in *Saccharomyces cerevisiae*. *Mol Cell Biol*. 19(12): 8180-90.

Romero. I.G., Pai, A.A., Tung, J., Gilad, Y. 2014. RNA-seq: impact of RNA degradation on transcript quantification. *BMC Biology*. 12: 42.

Rose, R.J., Nolan, K.E. 2006. Invited review: Genetic regulation of somatic embryogenesis with particular reference to *Arabidopsis thaliana* and *Medicago truncatula*. *In Vitro Cellular & Developmental Biology* – Plant. 42(6): 473-481.

Rose, A.J., Vegiopoulos, A., Herzig, S. 2010. Role of glucocorticoids and the glukokorticoid receptor in metabolis: *Insight* from manipulations. *J Steroid Biochem Mol Biol*. 122: 10-20.

Rossin, C.B. dan Rey, M.E.C. 2011. Effect of explant source and auxins on somatic embryogenesis of selected cassava (*Manihot esculenta* Crantz) cultivars. *S Afr J Bot*. 77:59-65.

Roy, J., Banerjee, N. 2001. Cultural requirement for *in vitro* seed germination, protocorm growth and seedling development of *Geodorum densiflorum* (Lam.) Schltr. *Indian Journal of Experimental Biology*. 39: 1041-47.

Rouhier, N., Couturier, J., Johnson, M.K., Jacquot, J.P. 2010. Glutaredoxins: role in iron homeostasis. *Trends Biochem. Sci*. 35: 43-52.

Rudus, I., Weiler, E.W., Kepczynska, E. 2009. Do stress-related phytohormones, abscisic acid and jasmonic acid play a role in the regulation of *Medicago sativa* L. somatic embryogenesis? *Plant Growth Regul*. 59: 159–169.

Saze, H., Scheid, O.M., Paszkowski, J. 2003. Maintenance of CpG methylation is essential for epigenetic inheritance during plant gametogenesis. *Nat Genet*. 34: 65–69.

Schauser, L., Wieloch, W., Stougaard, J. 2005. Evolution of NIN-like proteins in *Arabidopsis*, rice, and *Lotus japonicus*. *J Mol Evol*. 60: 229-237.

Schiff, J.L. 2018. What are orchids? Pp. 99-50. *In* Rare and Exotic Orchids. Springer Cam.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Schmülling, T. 2004. Cytokinin. *In* Lennarz, W., Lane, M.D (eds). *Encyclopedia chemistry*. Academix Press. Elsevier Science. Amsterdam.

Schuiteman, A. 2010. Orchid in Indonesia and Their Conservation. *Proceeding in International Seminar on Orchid Conservation and Agribusiness*, Yogyakarta, 27 Oktober 2010.

Schlereth, A., Moller, B., Liu, W., Kientz, M., Flipse, J., Rademacher, E.H., Schmid, M., Jurgens, G., Weijers, D. 2010. MONOPTEROS controls embryonic root initiation by regulating a mobile transcription factor. *Nature*. 464: 913–916.

Schlücking, K., Edel, K. H., Köster, P., Drerup, M. M., Eckert, C., Steinhorst, L., et al. 2013. A new b-estradiol-inducible vector set that facilitates easy construction and efficient expression of transgenes reveals CBL3-dependent cytoplasm to tonoplast translocation of CIPK5. *Mol. Plant* 6:1814–29.

Semiarti, E., Indrianto, A., Purwantoro, A., Isminingsih, S., Suseno, N., Ishikawa, T., Yoshioka, Y., Machida, Y., Machida, C. 2007. *Agrobacterium*-mediated transformation of the wild orchid species *Phalaenopsis amabilis*. *Plant Biotechnol*. 24: 265-272.

Semiarti, E., Indrianto, A., Purwantoro, A., Machida, Y., Machida, C. 2011. *Agrobacterium*-mediated transformation of Indonesian orchids for micropropagation.https://www.intechopen.com/books_genetic_transformation_agrobacterium_mediated_transformation_of_indonesian_orchids_for micropropagation.pdf. Diakses pada 11 Pebruari 2018.

Semiarti, E., Indrianto, A., Suyono, E.A., Nurwulan, R.L., Restiani, R., 2010a, Mikropropagasi tanaman anggrek hitam *Coelogyne pandurata* Lindl. dengan penyisipan gen penumbuh tunas melalui *Agrobacterium*, Seminar Nasional Biologi, 592-599.

Semiarti, E., Indrianto, A., Purwantoro, A., Martiwi, I.N.A., Feroniasanti, Y.M.L., Nadifah, Y., Machida, C., 2010b. High-frequency genetic transformation of Phalaenopsis amabilis orchid using tomato extract enriched medium for the pre-culture of protocorms, *Journal of Horticultural Science & Biotechnology*, 85 (3): 205-210.

Semiarti, E., Indrianto, A., Suyono, E.A., Nurwulan, R.L., Restiani, R., Machida, Y., Machida, C. 2010c. Genetic transformation of the Indonesian black orchid (*Coelogyne pandurata* Lindley) through *Agrobacterium tumefaciens* for micropropagation. pp. 16–20. *In* Proceedings of NIOC, Nagoya Dome. Japan.

Setiari, N., Purwantoro, A., Moeljopawiro, S., Semiarti, E. 2016. Peptone and tomato extract induced early stage of embryo development of *Dendrobium phalaenopsis* orchid. *Journal of Tropical Biodiversity and Biotechnology*. 1(2): 77-84.

Setiari, N., Purwantoro, A., Moejopawiro, S., Semiarti, E. 2018. Micropropagation of *Dendrobium phalaenopsis* Orchid Through Overexpression of Embryo Gene *AtRKD4*. *AGRIVITA Journal of Agricultural Science*. 40(2): 284-294.

Shafee, T., Lowe, R. 2017. Eukaryotic and prokaryotic gene structure. *WikiJournal of Medicine*. 4 (1): 1-5.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Shahsavari, E. 2011. Impact of tryptophan and glutamine on the tissue culture of upland rice. *Plant Soil Environ*. 57(1):7-10.

Shaner, N.C., Campbell, R.E., Steinvach, P.A., Giepmands, B.N.G., Palmer, A.E., Tsien, R.T. 2004. Improved monomeric red, orange, and yellow fluorescent proteins derived from *Discosoma* sp. red fluorescent protein. *Nature biotechnology*. 22(12):1567-72.

Shanker, S., Paulson, A., Edenberg, H.J., Peak, A., Perera, A., Alekseyev, Y.O., Beckloff, N., Bivens, N.J., Donnelly, R., Gillaspy, A.F., Grove, D., Gu, W., Jafari, N., Kerley-Hamilton, J.S., Lyons, R.H., Tepper, C., Nicolet, C.M. 2015. Evaluation of commercially available RNA amplification kits for RNA sequencing using very low input amounts of total RNA. *Journal of Biomolecular Techniques*. 26(1): 4-18.

Shekarriz, P., Kafi, M., Deilamy, S.D., Mirmasoumi, M. 2014. Coconut water and peptone improve seed germination and protocorm-like body formation of hybrid *Phalaenopsis*, *Agric. sci. dev*. 3(10): 317-322.

Shrestha, B. 2007. Study of beta lactamase activity of Staphylococcus aureus isolated from healthy nasal carries and hospital isolates. *Napal Med Coll Journal*. 9(2): 107-110.

Siloto, R.M.P., Findlay, K., Lopez-Villalobos, A., Yeung, E.C., Nykiforuk, C.L., Moloney, M.M. 2006. The accumulation of Oleosins determines the size of seed oilbodies in *Arabidopsis*. *The Plant Cell*. 18: 1961-74.

Singer, K., Shiboleth, Y.M., Li, J., Tziva, T. 2012. Formation of complex extrachromosomal T-DNA structures in Agrobacterium tumefacies-infected plants. *Plant Physiol*. 160: 511-522.

Singh, D.K., Babbar, S.B. 2016. *In vitro* propagation and chemical profiling of *Herminium lanceum* (Thunb. Ex Sw.) Vuijk, a medicinally important orchid, for therapeutically important phenolic acids. *Plant Biotechnology*. 33(3): 153-160.

Sjahril, R., Mii, M. 2006. High-efficiency *Agrobacterium*-mediated transformation of *Phalaenopsis* using meropenem, a novel antibiotic to eliminate *Agrobacterium*. *J Hort Sci Biotechnol*. 81: 458–464.

Smertenko, A., Bozhkov, P.V. 2014. Somatic embryogenesis: life and death processes during apical-basal patterning. *J Exp Bot*. 65: 1343-1360.

Smith, Z.R., Long, J.A. 2010. Control of Arabidopsis apical-basal embryo polarity by antagonistic transcription factors. *Nature*. 464: 423–426.

Soad, Ibrahim, M.M., Taha, L.S. and Farahat, M.M.. 2010. Influence of Foliar Applicaton of Peptone on Growth, Flowering and Chemical Compositon of *Helichrysum bracteatum* Plants under Different Irrigaton Intervals. *Ocean Journal of Applied Sciences*. 3(1), 143-155.

Sreekala, C., Wu, L., Gu, K., Wang, D., Tian, D., and Yin, Z. 2005. Excision of a selectable marker in transgenic rice (*Oryza sativa* L.) using a chemically regulated Cre/*loxP* system. *Plant Cell Rep.* 24:86–94.

Steven, A.F. 2008. Moth orchid: The complete guide to *Phalaenopsis*. Timber Press Inc. Oregon, London.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Su, Y,H., Liu, Y.B., dan Zhang, X.S. Establishment of embryonic shoot-root axis is involved in auxin and cytokinin response during *Arabidopsis* somatic embryogenesis. *Front Plant Sci*. 5: 792.

Su, Y.H., Zhao, X.Y., Liu, Y.B., Zhang, C., O'Neill, S.D., Zhang, X.S. 2009. Auxin-induced US expression is essential for embryonic stem cell renewal during somatic embryogenesis in *Arabidopsis*. *Plant J*. 59: 448-460.

Subramaniam, S., Xavier, R. 2010. Emerging factors that influence efficiency of TDNA gene transfer into *Phalaenopsis Violacea violacea* orchid via *Agrobacterium tumefaciens*–mediated transformation system. *Int J Biol*. 2: 64–73.

Suh, M.C., Samuels, A.L., Jetter, R., Kunst, L., Pollard, M., Ohlorogge, J., Beisson, F. 2005. Cuticular lipid composition, surface structure, and gene expression in Arabidopsis stem epidermis. *Plant Physiology*. 139:1649-65.

Sujjaritthukararn, P. and Kanchanapoom, K. 2010. Efficient direct protocorm-like bodies induction of Dwarf *Dendrobium* using thidiazuron. *Not Sci Biol*. 3: 1-5.

Suryowinoto, M. 1982. Mengenal anggrek-anggrek spesies. Fakultas Biologi Universitas Gadjah Mada.

Sutater, T. dan Badriah, D.S. 1994. Koleksi dan karakterisasi anggrek *Phalaenopsis*. Buletin Penelitian Tanaman Hias. Vol. 1. Sub Balai Penelitian Hortikultura Cipanas, Puslitbang Hortikultura.

Tanaka, H., Watanabe, M., Sasabe, M., Hiroe, T., Tanaka, T, Tsukaya, H., Ikezaki, M, Machida, M., Machida, Y. 2007. Novel receptor-like kinase ALE2 controls shoot development by specifying epidermis in Arabidopsis. *Development*. 134: 1643-52.

Teixeira da Silva, J.A., Cardoso, J.C., Dobránszki, J., Zeng, S. 2015. *Dendrobium* micropropagation: a review. *Plant Cell Rep*. 34: 617-704.

Teixeira da Silva, J.A., Chin, D.P., Van, P.T., Mii, M. 2011. Transgenic orchid. *Sci Hort*. 130: 673-680.

Teixeira da Silva, J.A., Winarto, B. 2016. Somatic embryogenesis in two orchid genera (*Cymbidium*, *Dendrobium*). pp. 371-386. *In* Germaná, M.A. and Lambardi, M (Eds). *In vitro embryoenesis in higher plants*. Vol 1359. Springer Science+Bussines Media. New York.

Thomann, E.B., Sollinger, J., White, C., Rivin, C.J. 1992, Accumulation of group 3 late embryogenesis abundant proteins in *Zea mays* embryos. *Plant Physiol*. 99: 607 – 614.

Tivendale, N.D., Ross, J.J., Cohen, J.D. 2014. The shifting paradigms of auxin biosynthesis. *Trends Plant Sci*. 19: 44–51.

Tokuhara, K. dan Mii, M. 2001. Induction of embryogenic callus and cell suspension culture from shoot tips excised from flower stalk buds of *Phalaenopsis* (Orchidaceae). *In Vitro Cell Dev Biol Plant*. 37: 457-461.

Tsai Chi-Chu, Shih Huei-Chuan, Wang Hao-Ven, Lin Yu-Shium, Chang Chia-Hung, Chiang Yu-Chung, Chou Chang-Hung (2015) RNA-Seq SSRs of Moth Orchid and Screening for Molecular Markers across Genus *Phalaenopsis* (Orchidaceae). *Plos One* 10: e0141761.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur
Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Tsay, H.S., Ho, H.M., Gupta, S.K., Wang, C.S., Chen, P.T., Chen, E.C.F. 2012. Development of pollen mediated activation tagging system for *Phalaenopsis* and *Doritaenopsis* Electron. *J Biotechnol*. 15: 1-10.

Tsuwamoto, R., Yokoi, S., Takahata, Y. 2010. Arabidopsis EMBRYOMAKER encoding an AP2 domain transcription factor plays a key role in developmental change from vegetative to embryonic phase. *Plant Mol Biol*.73: 481-492.

Tvorogova, T.E. dan Lutova, L.A. 2018. Genetic regulation of zygotic embryogenesis in angiosperm plants. *Russ Plant J Physiol*. 66: 1-14.

Utami, E.S.W., Sumardi, I., Taryono, Semiarti, E. 2007. Pengaruh α-napthaleneacetic acid (NAA) terhadap embriogenesis somatik anggrek bulan *Phalaenopsis amabilis* (L.) Bl. *Biodiversitas*. 8: 295-299.

Utami, E.S.W dan Hariyanto, S. 2016. The effect of organic nutrient and growth regulators on seed germination, embryo and shoots development of *Dendrobium antennatum* by *in vitro*, *Biosantifika*, 8 (2): 165-171.

Utami, E.S.W., Hariyanto, S., Manuhara, Y.S.W., 2017. *In vitro* propagation of the endangered medicinal orchid, *Dendrobium lasianthera* J.J.Sm through mature seed culture, *Asian Pac J Trop Biomed*, 7(5): 406-410

Valentine, L. 2003. *Agrobacterium tumefaciens* and the plant: the David and Goliath of modern Genetics. *Plant Physiol*. 133: 948e55.

Van, P.T., Teixeira da Silva, J.A., Ham, L.H., Tanaka, M. 2012. How does choice of substrate and culture conditions affect the growth and development of *Cymbidium* cv. Green Planet 'Energy Star' protocorm-like bodies? *Europ J Hort Sci*. 77: 219-225.

Vendrame, W.A. and Maguire, I. 2007. In vitro propagation and plantlet regeneration from *Doritaenopsis* Purple Gem 'Ching Hua' flower explants. *Hort Science*. 42: 1256-1258.

Victor, J.M.R., Murthy, B.N.S., Murch, S.J., KrishnaRaj, S., Saxena, P.K. 1999. Role of endogenous purine metabolism in thidiazuron-induced somatic embryogenesis of peanut (*Arachis hypogaea*). *Plant Growth Regul*. 28: 41-47.

von Arnold, S., Sabala, I., Bozhkov, P., Dyachok, J., Filonova, L. 2002. Developmental pathways of somatic embryogenesis. *Plant Cell, Tissue and Organ Culture*. 69(3): 233-249.

Vondráková, Z., Eliášová, K., Fischerová, L., Vágner, M. 2011. The role of auxins in somatic embryogenesis of *Abies alba*. *Cent Eur J Biol*. 6: 587-596.

Vondráková, Z., Krajnáková, J., Fischerová, L., Vágner, M., Eliášová, K. 2016. Physiology and role of plant growth regulators in somatic embryogenesis. pp. 123-169. *In* Yill-Sung Park, J.M. Bonga. Heung-Kyu. M (eds). *Vegetative Propagation of Forest Trees*. National Institute of Forest Science. Korea.

Waki, T., Hiki, T., Watanabe, R., Hashimoto, T., Nakajima, K. 2011. The *Arabidopsis* RWP-RK protein RKD4 triggers gene expression and pattern formation in early embrogenesis. *Curr Biol*. 21: 1277-1281.

Wareing, P. F., Philips, I.D.J. 1981. The control of growth and differentiation in plants. Pergamon Press. USA.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Wasternack, C., Hause, B. 2002. Jasmonates and octadecanoids: signals in plant stress responses and development. *Prog Nucleic Acid Res Mol Biol*. 72: 165–221.

Wendrich, J.R. dan Weijers, D. 2013. The Arabidopsis embryo as a miniature morphogenesis model. *New Phytologist*. 199: 14-25.

White, C.L., Senkevich, T.G., Moss, B. 2000. A glutaredoxin, encoded by the G4L gene of vaccinia virus, is essential for virion morphogenesis. *J Virol*. 74: 9715-83.

Winarto, B., Atmini, K.D., Badriah, D.S., Wegadara, M. 2016. *In vitro* embryogenesis derived from shoot tips in mass propagation of two selected-clones of *Phalaenopsis*. *Not Sci Biol*. 8: 317-325.

Wojcikowska, B. and Gaj, M.D. 2015. LEAFY COTYLEDON2-mediated control of the endogenous hormone content: implication for the induction of somatic embryogenesis in *Arabidopsis*. *Plant Cell Tiss Org Cult*. 121: 255-258.

Wright, M., Guest, D., Cross, R. 2005. Development of mycorrhiza association in *Caladenia tentaculata*. *Selbyana* 26:114–124

Wu, K., Zeng, S., Teixeira da Silva, J.A., Chen, Z., Zhang, J., Yang, Y., Duan, J. 2012. Efficient regeneration of *Renanthera* Tom Thumb 'Qilin' from leaf explants. *Sci Hort*. 135: 194-201.

Xu, J., Sun, J., Chen, J., Wang, L., Li, A., Helm, M., Dubovsky, S.L., Bacanu, S.A., Zhao, Z., Chen, X. 2012. RNA-Seq analysis implicates dysregulation of the immune system in schizophrenia. *BMC Genomics*. 8:S2.

Yadav, N.S., Van der Leyden, J., Bennett, D.R., Barnes, W.M., Chilton, M.D. 1982. Short direct repeats flank the T-DNA on a nopaline Ti plasmid. *Proc Natl Acad Sci USA*. 79: 6322e6.

Yang, X. dan Zhang, X. 2010. Regulation of somatic embryogenesis in higher plants. *Crit Rev Plant Sci*. 29: 36-57.

Yee, N.C., Abdullah, J.A., Mahmood, M., Basiron, N. 2008. Co-transfer of gfp, CHS and hptII genes into *Oncidium* Sharry Baby PLB using the biolistic gun. *Afr J Biotechnol*. 7: 2605–2617.

Yeri, A., Courtright, A., Danielson, K., Hutchins, E., Alsop, E., Carlson, E., Hsieh, M., Ziegler, O., Das, A., Shah. R.V., Rozowsky, J., Das, S., Van, Keuren-Jensen, K.. 2018. Evaluation of commercially available small RNASeq library preparation kits using low input RNA. *BMC Genomics*. 19: 1-15.

Yeung, E.C. 2017. A perspective on orchid seed and protocorm development. *Bot Stud*. 58: 1-14.

Yu, H., Xu, H. 2007. Orchids. *In* Pua, E.C., Davey, M.R. (Eds) Transgenic Crops VI. Biotechnology in Agriculture and Forestry. *Springer*. 61:73-279.

Yumbla-Orbes, M., Ferreira da Cruz, A.C., Marques Pinheiro, M.V., Rocha, D.I., Batista, D. S., Koehler, A.D., Barbosa, J. G., Otoni W.C. 2017. Somatic embryogenesis and de novo shoot organogenesis can be alternatively induced by reactivating pericycle cells in Lisianthus (*Eustoma grandiflorum* (Raf.) Shinners) root explants. *In Vitro Cell. Dev. Biol. - Plant* 53: 209 – 218.

UNIVERSITAS GADJAH MADA
Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur Tumbuh dan Transformasi Genetik
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Zaliauskience, L., Kang, S., Brouillette, C., Christie, G., Lebowitz, J., Arani, R,B., Collawn, J.F. 2016. Down-regulation of cell surface receptors is modulated by polar residues within transmembrane domain. *Molecular Biology of the cell.* 11(8): 2643-55.

Zanten, M., Zöll, C., Wang, Z., Philipp. C., Carles, A., Li, Y., Kornet, N.G., Liu, Y., Soppe, W.J. 2014. HISTONE DEACETYLASE 9 represses seedling traits in *Arabidopsis thaliana* dry seeds. *Plant J*. 80: 475-488.

Zeng, W., Mortazavi, A. 2012. Technical considerations for functional sequencing assays. *Nature Immunology*. 13(9):802–807.

Zhang, G., Song, C., Zhao, M.M., Li, B., Guo, S.X. 2012. Characterization of an A-type cyclin-dependent kinase gene from Dendrobium candidum. *Biologia*. 67: 360–368.

Zhang, S., Chen, L., Goff, S. A. 2007. Regulation of gene expression by small molecules in rice. *in* Novartis Foundation Symposium 236 – Rice Biotechnology: Improving Yield, Stress Tolerance and Grain Quality, eds J. A. Goode and D. Chadwick (Chichester: *John Wiley & Sons*), 85–96.

Zhang, J., Addepalli, B., Yun, K.Y., Hunt, A.G., Xu, R., Rao, S., Li, Q.Q., Falcone, D.L. 2008. A polyadenylation factor subunit implicated in regulating oxidative signalling in *Arabidopsis thaliana*. *PLoS One*. 3(6): e2410.

Zhang, G., Guo, G., Hu, X., Zhang, Y., Li, Q., Li, R., Zhuang, R., Lu, Z., He, Z., Fang, X., Chen,L., Tian, W., Tao, Y, Kristiansen, K., Zhang, X., Li, S., Yang, H., Wang, J., Wang, J. 2010. Deep RNA sequencing at single base-pair resolution reveals high complexity of the rice transcriptome. *Genome Research*. 20(5): 646-54.

Zhang, Y. Y., Wu, K.L., Zhang, J.X., Deng, R.F., Duan, J., da Silva, J.A.T., Huang, W.C., & Zeng, S.J., 2015, Embryo development in association with asymbiotic seed germination *in vitro* of *Paphiopedillum armeniacum* S. C. Chen et F. Y. Liu, *Scientific Reports*. 5(16356): 1-15.

Zhang, G-Q., X, Q., Bian, C. 2015. The *Dendrobium catenatum* Lindl. genome sequences provides insights into polysaccharide synthase, floral development and adaptive evolution. Sci Rep. 6(19029):1-10.

Zhang, G-Q., Liu Ke-Wei. Li, Z., Lohaus, R., Hsiao, Y-Y., Niu, S-C., Wang, J-Y., Lin, Y-C., Xu, Q., Chen, L-J., Yoshida, K., Fujiwara, S., Wang, Z-W., Zhng, Y-Q., Mitsuda, N., Wang, M., Liu, G-H., Pecoraro, L., Huang, H-X., Xiao, X-J., Lin, M., Wu, Y-W., Wu, W-L., Chen, Y-Y., Chang, S-B., Sakamoto, S., Ohme-Takagi, M., Yagi, M., Zeng, S-J., Shen, C-Y., Yeh, C-M., Luo, Y-B., Tsai, W-C., Van de Peer, Y., Liu, Z-J. 2017. The *Apostasia* genome and evolution of orchids. *Nature*. 549: 379-383.

Zhao, P., Wu, F., Feng, F.S., Wang, W.J. 2008. Protocorm-like body (PLB) formation and plant regeneration from the callus culture of *Dendrobium candidum* Wall ex Lindl. *In Vitro Cell Dev Biol Plant*. 44: 178-185.

Zhao, S., Fung-Leung, W.P., Bittner, A., Ngo, K., Lui, X. Comparison of RNA-seq and microarray in transcriptome profiling of activated T cells. *PLos One*. 9(1): e78644

Zhao, Y. 2014. Auxin biosynthesis. *The Arabidopsis Book*. 12: e0173.

UNIVERSITAS
GADJAH MADA
**Induksi Embriogenesis Somatik Tanaman Anggrek Phalaenopsis amabilis (L.) Blume dengan Zat Pengatur
Tumbuh dan Transformasi Genetik**
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Universitas Gadjah Mada, 2019 | Diunduh dari http://etd.repository.ugm.ac.id/

Zottich, U., Da Cunha, M., Carvalho, A.O., Dias, G.B., Silva, N.C., Santos, I.S., do Nacimento, V.V., Miguel, E.C., Machado, O.L., Gomes, V.M. 2011. Purification, biochemical characterization and antifungal activity of a new lipid transfer protein (LTP) from *Coffea canephora* seeds with α-amylase inhibitor properties. *Biochem Biophys Acta – General Subjects*. 1810: 375-383.

Zuo, J., Chua, N.H. 2000. Chemical-inducible systems for regulated expression of plant genes. *Current Opinion in Biotechnology*. 11(2): 146-151.

Zuo, J., Niu, Q. W., and Chua, N. H. 2000. An estrogen receptor-based transactivator XVE mediates highly inducible gene expression in transgenic plants. *Plant J.* 24: 265–273.

Zuo, J., Niu, Q.W., Moller, S.G., Chua, N.H. 2001. Chemical-regulated, site-specific DNA excision in transgenic plants. *Nat Biotehcnol*. 19(2): 157-161.