DAFTAR PUSTAKA

Addgene. 2016. pTA2007-avrPto. (https://www.addgene.org/49156/). Diakses tanggal 11 mei 2021.

Abohatem, M. A., Bakil, Y., and Baaziz, M. 2017. Plant regeneration from somatic embryogenic suspension cultures of date palm, in Date Palm Biotechnology Protocols, Vol. I, eds J. Al-Khayri, S. Jain, and D. Johnson (New York, NY: *Springer*), 203–214.

Achterborsch, T. J., van Berkum, S., Meijerik, G. W. 2014. *Cash Crops and Food Security; Contributions to Income, Livelihood Risk and Agricultural Innovation*. Wageningen UR LEI Report, 56 p.

Ahmed, W., Feyissa, T., Disasa, T. 2013. Somatic embryogenesis of a coffee (*Coffea arabica* L.) hybrid using leaf explants. *J HortSciBiot*. 88: 469–475.

Albuquerque, E. V. S., Cunha, W. G., Barbosa, A. E. A. D., Costa, P. M., Teixeira, J. B., Vianna, G. R., Cabral, G. B., Fernandez Diana, Grossi-de-Sa, M. F. 2009. Transgenic coffee fruits from *Coffea arabica* genetically modified by bombardment. *In Vitro Cell Dev Biol Plant*. 45: 532–539.

Ali, A. A., Ahmad, T., Abbasi, N. A., Hafiz, I. A. 2009. Effect of different concentrations of auxins on *in vitro* rooting of olive cultivar Moraiolo. *Pak. J. Bot.* 41(3): 1223-1231.

Almeida, J. A. S., Silvarolla, M. B. 2009. Induction of somatic embryos of *Coffea arabica* genotypes by 6-benzyladenine. *International Journal of Plant Developmental Biology*. 53: 5-8.

Almeida, J. A. S., Silvarolla, M. B., Fazuoli, L. C., Stancato, G. C. 2008. Embriogênese somática em genótipos de *Coffea arabica* L. *Coffee Science*. 3: 143–151.

Amack, S. C. and Antunes, M. S. 2020. CaMV35S promoter – A plant biology and biotechnology workhorse in the era of synthetic biology. *Current Plant Biology*. 24 (100179): 1-9

Amal, T. C., Karthika, P., Dhandapani, G., Selvakumar, S., Vasanth, K., 2020. A simple and efficient *Agrobacterium*-mediated *in planta* transformation protocol for horse gram (*Macrotyloma uniflorum* Lam. Verdc.). *J. Genetic Eng. Biotechnol*. 18: 1–9.

Andrea Silva de Almeida, J. 2020. *Observations on Somatic Embryogenesis in Coffea arabica L. Coffee - Production and Research*. Dalyse Toledo Castanheira, IntechOpen, Brazil, 20 p.

Aravind, L., Koonin, E. V. 2000. SAP - a putative DNA-binding motif involved in chromosomal organization. *Trends Biochem Sci*. 25(3): 112-4.

Ardiyani, F. 2015. Morphological characterization and identification of *Coffea liberica* callus of somatic embryogenesis propagation. *Jurnal Pelita Perkebunan*. 31(2): 81–89.

Arroyo-Herrera, A., Ku-Gonzalez, A., Canche-Moo, R., Quiroz-Figueroa, F. R., Loyola-Vargas, V. M., Rodriguez-Zapata, L. C., Burgeff D'Hondt, C., Suarez-Solıs, V. M., Castano, E. 2008. Expression of WUSCHEL in *Coffea canephora* causes ectopic morphogenesis and increases somatic embryogenesis. *Plant Cell Tissue Organ Cult*. 94: 171–180.

Asande, L. K., Omwoyo, R. O., Oduor, R. O., Nyaboga, E. N. 2020. A simple and fast *Agrobacterium*-mediated transformation system for passion fruit KPF4 (*Passiflora edulis* f. *edulis* × *Passiflora edulis* f. *flavicarpa*). *Plant Methods.* 16 (141): 1-12.

Awasthi, P., Sharma, V., Kaur, N., Kaur, N., Pandey, P., and Tiwari, S. 2017. Genome-wide analysis of transcription factors during somatic embryogenesis in banana (*Musa spp*.) cv. Grand naine. *PLoS One*. 12: 1-19

Ayil-Gutiérrez, B. A., Galaz-Ávalos, R. M., Peña-Cabrera, E., and 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: 1-10.

Bacon, C. 2005. Confronting the coffee crisis: Can fair trade, organic, and specialty coffees reduce small-scale farmer vulnerability in Northern Nicaragua? *World Development*. 33 (3): 497-511.

Badan Pusat Statistik (BPS). 2020. *Statistik Kopi Indonesia*. (http://bps.go.id). Diakses tanggal 10 April 2022.

Baker, P. 2014. Global Coffee Production and Land Use Change. *Conference Paper*. *Conference: 25 The Conference of ASIC*. Association Scientifique Internationale pour le Café, 1-15 p.

Bartos, P. M. C., Gomes, H. T., do Amaral, L. I. V., Teixeira, J. B., & Scherwinski-Pereira, J. E. 2018. Biochemical events during somatic embryogenesis in *Coffea arabica* L. *3 Biotech*. *8*(4): 1–10.

Bartos, P. M. C., Gomes, H. T., Gomes, S. M., Filho, S. C. V., Teixeira, J. B., Pereira, J. E. S. 2018. Histology of somatic embryogenesis in *Coffea arabica* L. *Biologia*. 73: 1255–1265.

Berthouly, M. and Etienne, H. 1999. Somatic Embryogenesis of Coffee. In: Jain, S.M., Gupta, P.K., Newton, R.J. (eds) Somatic Embryogenesis in Woody Plants. Springer, Dordrecht: Forestry Sciences, v 59, p. 259–287.

Beyene, A, Y. Kassahun, T. Addis, F. Assefa, A. Amsalu, W. Legesse, H. Kloos, L. Triest. 2012. The impact of traditional coffee processing on river water quality in Ethiopia and the urgency of adopting sound environmental practices. *Environ. Monit. Assess*. 184 (11): 7053-7063.

Birch, R. G. 1997. Plant transformation: problems and strategies for practical application. *Ann Rev Plant Physiol Plant Mol Bio*. 48: 297-326.

Bitton, D. A., Wood, V., Scutt, P. J., Grallert, A., Yates, T., Smith, D. L., Hagan, I. M., Miller, C. J. 2011. Augmented annotation of the Schizosaccharomyces pombe genome reveals additional genes required for growth and viability. *Genetics*. 187(4): 1207-17.

Boutilier, K., Angenent, G. C., Castan, M. S. Hui, L. 2016. Haploid Embryogenesis. Patent US20160212956A1, 28 July 2016.

BPS. 2018. *Statistik Kopi Indonesia*. Sub Direktorat Statistik Tanaman Perkebunan. BPS, Jakarta, 1-77 p.

Buckseth, T., Singh, R. K., Ashwani, Sharma, K., Sharma, S., Moudgil, V., Saraswati, A. 2018. Optimization of Activated Charcoal on in vitro Growth and Development of Potato (*Solanum tuberosum* L.). *International Journal of Current Microbiology and Applied Sciences*. 7(10): 3543-3548.

Campos, N. A., Panis, B., Carpentier, S. C. 2017. Somatic embryogenesis in coffee: the evolution of biotechnology and the integration of Omics technologies offer great opportunities. *Front Plant Sci*. 8(1460): 1-12.

Canche-Moo, R. L. R., Ku-Gonzalez, C., Burgeff, C., Loyola-Vargas, V. M., Rodríguez-Zapata, L. C. & Castaño, E. 2006. Genetic transformation of *Coffea canephora* by vacuum infiltration. *Plant Cell Tissue Organ Cult*. 84: 373–377.

Cano, V., Martínez, M. T., Couselo, J. L., Varas, E., Vieitez, F. J., Corredoira, E. 2021. Efficient Transformation of Somatic Embryos and Regeneration of Cork Oak Plantlets with A Gene (*CsTL1*) Encoding a Chestnut Thaumatin-Like Protein. *Int J Mol Sci*. 22(4) 1757: 1-24.

Cetz-Chel, J. E., and Loyola-Vargas, V. M. 2016. Transcriptome profile of somatic embryogenesis, in Somatic Embryogenesis. Fundamental Aspects and Applications, eds V. M. Loyola-Vargas and N. Ochoa-Alejo (Cham: *Springer*), 39–52.

Chardin, C., Girin, T., Roudier, F., Meyer, C., Krapp, A. 2014. The plant RWP-RK transcription factors: key regulators of nitrogen responses and of gametophyte development. *Journal of Experimental Botany*. 65 (19): 5577–5587.

Chu, Z., Chen, J., Sun, J., Dong, Z., Yang, X., Wang, Y., Xu, H., Zhang, X., Chen, F. & Cui, D. 2017. De novo assembly and comparative analysis of the transcriptome of embryogenic callus formation in bread wheat (*Triticum aestivum* L.). *BMC Plant Biol*. 17(244): 1-22.

Coleman, R. J., Patel, Y. N., Harding, N. E. 2008. Identification and organization of genes for diutan polysaccharide synthesis from *Sphingomonas* sp. ATCC 53159. *J Ind Microbiol Biotechnol.* 35(4): 263-74.

Corredoira, E., Ballester, A., Ibarra, M., Vieitez, A. M. 2015. Induction of somatic embryogenesis in explants of shoot cultures established from adult *Eucalyptus globulus* and *E. saligna _ E. maidenii* trees. *Tree Physiol*. 35: 678–690.

Cruz, A. R. R., Paixão, A. L. D., Machado, F. R., Barbosa, M. F. De F., Junqueira, C. S., Cabral, G. B., Teixeira, J. B., Kobayashi, A. K., Brasileiro, A. C. M., Barros, E. V. S. A. 2004. Obtenção de plantas transformadas de *Coffea canephora* por co-cultivo de calos embriogenicos com *A. tumefaciens*. *Bol Pesq Desenvol*. 73, Embrapa Brasília. 1-15 p.

Cunha, W. G., Machado, F. R. B., Vianna, G. R., Teixeira, J. B., Barros, E. V. S. A. De. 2004. Obtenção de *Coffea arabica* geneticamente modificadas por bombardmento de calos embriogenecos. *Bol Pesq Desenvol*.73. Embrapa Brasilia. 1-15 p.

Curtis, M. D. and Grossniklaus, U. 2003. A gateway cloning vector set for highthroughput functional analysis of genes in planta. *Plant Physiol*. 133(2): 462-469.

Debnath, S. C. 2018. In Thidiazuron: From Urea Derivative to Plant Growth Regulator (eds. Naseem, A. & Mohammad, F.). *Springer*. 139–158.

De La Riva, G. A., González-Cabrera, J., Vázquez-Padrón, R., Ayra-Pardo, C. 1998. *Agrobacterium tumefaciens*: A natural tool for plant transformation. *Electronic Journal of Biotechnology*. 31: 25-48.

DNA/RNA GC Content Calculator. (http://www.endmemo.com/bio/gc.php). Diakses 3 November 2022.

Dodeman, V. L., Ducreux, G., and Kreis, M. 1997. Zygotic embryogenesis versus somatic embryogenesis. *J. Exp. Bot*. 48: 1493–1509.

Dowell, K. 2005. Molecular Phylogeneticsan Introduction to Computational Methods and Tools for Analyzing Evolutionary Relationships. *Math*. 500:1-19.

Dublin P. 1984. Techniques de reproduction végétative in vitro et amélioration génétique chez les caféiers cultivés. *Café Cacao Thé*. 28: 231–244.

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

Etienne, H. 2005. "Somatic embryogenesis protocol: coffee (*Coffea arabica* L. and *C. canephora* P.)," in Protocols for Somatic Embryogenesis in Woody Plants, eds S. M. Jain and P. K. Gupta (*Dordrecht: Springer*), 167–179.

Etienne, H. 2005. Somatic embryogenesis protocol: Coffee (*Coffea arabica* L. and *C. canephora* P.). In Protocols for Somatic Embryogenesis in Woody Plants; Jain, S.M., Gupta, P.K., Eds.; *Springer: Dordrecht*. The Netherlands. pp. 167–179.

Etienne, H., Lashermes, P., Menéndez-Yuffá, A., Guglielmo-Cróquer, Z., Alpizar, E., Sreenath H. 2008. Coffee. In A Compendium of Transgenic Crop Plants. Volume 8. Edited by: Kole C, Hall TC. Oxford: Blackwell Publishing. 57-84.

FAOSTAT. 2014. *FAOSTAT Data*. (http://www.fao.org/faostat/en/#data/QC/visualize). Diakses tanggal 1 September 2016.

Farah, A. 2012. *Coffee Constituents*. In Y.-F. Chu (Ed.), *Coffee: Emerging Health Effects and Disease Prevention*. John Wiley & Sons, Inc., Wiley-Blackwell, 21–58 p.

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

Fitriana, D., E Prihastanti, Y Nurchayati, and R B Hastuti. 2019. Effect of combination explant difference leaf part and concentration of active charcoal on callus initiation mangrove (*Rhizophora apiculata* BI) by *in-vitro*. IOP Conf. Series: *Journal of Physics: Conf. Series* 1217 012166. IOP Publishing. 1-8 p.

Fleet, C. M. and Sun, T. 2005. A DELLAcate balance: the role of gibberellin in plant morphogenesis *Current Opinion in Plant Bio*. l (8): 77–85.

Florez, S. L., Erwin, R. L., Maximova, S. N., Guiltinan, M. J., and Curtis, W. R. 2015. Enhanced somatic embryogenesis in *Theobroma cacao* using the homologous BABY BOOM transcription factor. *BMC Plant Biol*. 15:121.

Footitt, S., Ingouff, M., Clapham, D., and von Arnold, S. 2003. Expression of the viviparous 1 (Pavp1) and p34cdc2 protein kinase (cdc2Pa) genes during somatic embryogenesis in Norway spruce (*Picea abies* [L.] Karst). *J. Exp. Bot*. 54: 1711–1719.

Furuta, K. M., Hellmann, E, Helariutta, Y. 2014. Molecular control of cell specification and cell differentiation during procambial development. *Annual Review of Plant Biology.* 65: 607–638.

Gasteiger, E., Hoogland, C., Gattiker, A., Duvaud, S., Wilkins, M. R., Appel, R. D., Bairoch, A. 2005. Protein Identification and Analysis Tools on the ExPASy Server. In: Walker, J.M. (eds) The Proteomics Protocols Handbook. Springer Protocols Handbooks. Humana Press Inc., Totowa, NJ, 1-37 p.

GenomNet. (https://www.genome.jp/tools/motif/). Diakses tanggal 6 November 2022.

Gimase, J. M., W. M. Thagana, D. T. Kirubi, E. K. Gichuru, C. W. Kathurima. 2014. Beverage quality and biochemical attributes of arabusta coffee (*C. arabica L. x C. canephora Pierre*) and their parental genotypes. *African Journal of Food Science*. 8 (9), pp. 456-464.

Giri, C. C., Shyamkumar, B. & Anjaneyulu, C. 2004. Progress in tissue culture, genetic transformation and applications of biotechnology to trees: An overview. *Trees - Structure and Function*. 218: 115-35.

Grzybkowska, D., Morosczyk, J., Wójcikowska, B., and Gaj, M. D. 2018. Azacitidine (5-AzaC)-treatment and mutations in DNA methylase genes

affect embryogenic response and expression of the genes that are involved in somatic embryogenesis in *Arabidopsis*. *Plant Growth Regul*. 85: 243–256.

Gunning, M. D. Y., Watson, A. D., Beadman, N., Colquhoun, I. J., Gall, G. L., Philo, M., Garwood, H., Williamson, D., Davis, A. P., Kemsley, E. K. 2018. 16-O-methylcafestol is present in ground roast Arabica coffees: Implications for authenticity testing. *Food Chemistry*. 248: 52-60.

Han, J. L., Wang, H., Ye, H. C., Liu, Y., Li, Z. Q., Zhang, Y., Zhang, Y. S., Yan, F., Li, G. F. 2005. High efficiency of genetic transformation and regeneration of *Artemisia annua* L. via *Agrobacterium tumefaciens*-mediated procedure. *Plant Sci*. 168(1): 73-80.

Hansen, G., Shillito, R. D. & Chilton, M. D. 1997. T-strand integration in maize protoplasts after codelivery of a T-DNA substrate and virulence genes. *Proceedings of the National Academy of Sciences of the United States of America* 2194: 11726-30.

Harding, E. W., Tang, W., Nichols, K. W., Fernandez, D. E., and Perry, S. E. 2003. Expression and maintenance of embryogenic potential is enhanced through constitutive expression of AGAMOUS-like 15. *Plant Physiol*. 133: 653–663.

Hatanaka, T., Arakawa, O., Yasuda, T., Uchida N, Yamaguchi T. 1991. Effect of plant growth regulators on somatic embryogenesis in leaf cultures of *Coffea canephora*. *Plant Cell Reports.* 10: 179–182.

Hatanaka, T., Choi, Y. E., Kusano, T., Sano, H. 1999. Transgenic plants of Coffea canephora from embryogenic callus via *Agrobacterium tumefaciens* – mediated transformation. *Plant Cell Rep*. 19: 106–110.

He, F. 2011. Laemmli-SDS-PAGE. *Bio-Protocol.* 1(11): 1-4.

Heda, G. D., Omotola O. B., Heda R. P., Avery J. 2016. Effects of reusing gel electrophoresis and electrotransfer buffers on western blotting. *Journal of Biomolecular Techniques*, 27(3): 113–118.

Hirons, M., Mehrabi, Z., Gonfa, T. A., Morel, A., Gole, T. W., McDermott, C., Boyd, E., Robinson, E., Sheleme, D., Malhi, Y., Mason, J., Norris, K. 2018. Pursuing climate resilient coffee in Ethiopia – A critical review. *Geoforum*. 91: 108-116.

Hoffmann, L., Schummer, A., Reimann, J., Haurat, M. F, Wilson, A. J., Beeby, M., Warscheid, B., Albers, S.V. 2017. Expanding the archaellum regulatory network - the eukaryotic protein kinases ArnC and ArnD influence motility of *Sulfolobus acidocaldarius*. *Microbiologyopen*. 6(1): 1-14.

Horstman, A., Bemer, M., & Boutilier, K. 2017. A transcriptional view on somatic embryogenesis. *Regeneration.* 4(4): 201–216.

Hu, B., Jin, J., Guo, A. Y., Zhang, H., Luo, J. and Gao, G. 2015. GSDS 2.0: an upgraded gene feature visualization server. *Bioinformatics*. 31(8): 1296-1297.

Hulupi, R. 2016. Panduan Determinasi Varietas dan Klon Kopi Indonesia Berdasarkan Sifat Morfologi. Pusat Penelitian Kopi dan Kakao Indonesia, Jember, 85p.

Huttly, A. K and Phillips, A. L. 1995. Gibberellin-regulated plant genes *Physiol. Plant.* 95: 310–317.

Ibrahim, M. S. D., Hartati, R. S., Rubiyo, R., Purwito, A., Sudarsono, S. 2013. Direct and indirect somatic embryogenesis on arabica coffee (*Coffea arabica*). *Indon J Agric Sci*. 14: 79-86.

ICO. 2016. *Assessing the Economic Sustainability of Coffee growing*. International Coffee Council 117th Session. (http://www.ico.org/documents/cy2015-16/icc-117-6e-economic-sustainability.pdf). Diakses tanggal 22 Maret 2022

ICO. 2019. *International Coffee Organization (ICO)*. Retrieved from, Trade statistics tables. (http://www.ico.org/prices/newconsumption-table.pdf). Diakses tanggal 22 Maret 2022.

Iida, T., Kawaguchi, R., Nakayama, J. 2006. Conserved ribonuclease, Eri1, negatively regulates heterochromatin assembly in fission yeast. *Curr Biol*. 16(14): 1459-64.

Ikeuchi, M., Iwase, A., Rymen, B., Harashima, H., Shibata, M., Ohnuma, M., Breuer, C., Morao, A. K., de Lucas, M., De Veylder, L., Goodrich, J., Brady, S. M., Roudier, F., Sugimoto, K. 2015. PRC2 represses dedierentiation of mature somatic cells in *Arabidopsis*. *Nat. Plants*. 1(7): 1-7.

Ikeuchi, M., Ogawa, Y., Iwase, A., Sugimoto, K. 2016. Plant regeneration: Cellular origins and molecular mechanisms. *Development*. 143: 1442–1451.

Ikeuchi, M., Shibata, M., Rymen, B., Iwase, A., Bågman, A. M., Watt, L., Coleman, D., Favero, D. S., Takahashi, T., Ahnert, S. E., Brady, S. M., Sugimoto, K. 2018. A gene regulatory network for cellular reprogramming in plant regeneration. *Plant Cell Physiol*. 59: 770–782.

Indoliya, Y., Tiwari, P., Chauhan, A.S., Goel, R., Shri, M.; Bag, S.K., Chakrabarty, D. 2016. Decoding regulatory landscape of somatic embryogenesis reveals di_erential regulatory networks between japonica and indica rice subspecies. *Sci. Rep*. 6(23050): 1-15.

Irene, W. M., Alumiro, H. L., Asava, K. K., Agwanda, C. O., Anami, S. E. 2019. Effects of Genotype and Plant Growth Regulators on Callus Induction in Leaf Cultures of *Coffea arabica* L. F1 Hybrid. *Journal of Plant Biochemistry & Physiology*. 7(2): 1-12

ITIS. 2023. *Integrated Taxonomic Information System – Report*. (https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=35190#null). Diakses tanggal 24 Maret 2022.

Iwase, A., Mita, K., Nonaka, S., Ikeuchi, M., Koizuka, C., Ohnuma, M., Ezura, H., Imamura, J., Sugimoto, K. 2015. WIND1-based acquisition of regeneration competency in *Arabidopsis* and rapeseed. *J. Plant Res*. 128: 389–397.

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

Jha, S., Bacon C., Philpott, S., Mendez, E., Laderach, P., Rice, R. 2014. Shade coffee: update on a disappearing refuge for biodiversity. *Bioscience*. 64 (5): 416-428.

Jiménez, V. M. 2005. Involvement of plant hormones and plant growth regulators on in vitro somatic embryogenesis. *Plant Growth Regul*. 47: 91–110.

Jones, B., Gunneras, S. A., Petersson, S. V., Tarkowski, P., Graham, N., May, S., Dolezal, K., Sandberg, G., Ljung, K. 2010. Cytokinin regulation of auxin synthesis in *Arabidopsis* involves a homeostatic feedback loop regulated via auxin and cytokinin signal transduction. *Plant Cell*. 22: 2956–2969.

Kahia, J., Kirika, M., Lubabali, H., Mantel, S. 2016. High-frequency direct somatic embryogenesis and plantlet regeneration from leaves derived from *in vitro*-germinated seedlings of a *Coffea arabica* hybrid cultivar. *Hortscience*. 51:1148- 1152.

Kalve, S., De Vos, D., Beemster, G. T. S. 2014. Leaf development: a cellular perspective. *Frontiers in Plant Science*. 5 (362): 1-25

Karthik, S., Pavan, G., Sathish, S., Siva, R., Kumar, P. S., Manickavasagam, M., 2018. Genotype-independent and enhanced *in planta Agrobacterium tumefaciens*-mediated genetic transformation of peanut (*Arachis hypogaea* (L.)). *Biotech*. 8 (202): 1-15

Katriani. 2010. *Penanganan dan penyimpanan benih rekalsitran*. Fakultas Pertaninan Universitas Hasanuddin, Makasar, 89 p

Klimaszewska, K., Hargreaves, C., Lelu-Walter, M., Trontin, J. 2016. Advances in conifer somatic embryogenesis since year 2000 In: Germanà MA, Lambardi M (eds) *In vitro* embryogenesis in higher plants methods in molecular biology. Springer Science and Business Media, New York, pp 131–166.

Kieber, J. J. and Schaller, G. E. 2014. *Cytokinins Arabidopsis Book*. 12: e0168. American Society of Plant Biologist, Washington, 35 p.

Kitzberger, C. S. G., Scholz, M. B. D. S., & Benassi, M. D. T. 2014. Bioactive compounds content in roasted coffee from traditional and modern *Coffea arabica* cultivars grown under the same edapho-climatic conditions. *Food Research International*. 61: 61–66.

Koi, S., Hisanaga, T., Sato, K., Shimamura, M., Yamato, K. T., Ishizaki, K., Kohchi, T., Nakajima, K. 2016. An evolutionarily conserved plant RKD factor controls germ cell differentiation. *Current Biology*. 26*:* 1–7.

Kőszegi, D., Johnston, A. J., Rutten, T., Altschmied, L., 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 Journal.* 67*:* 280–291.

Kotov, A. A., and Kotova, L. M. 2018. Auxin-cytokinin interactions in regulating correlative inhibition in two-branched pea seedlings. *J. Exp. Bot*. 69: 2967–2978.

Krishnan, A., Burroughs, A. M., Iyer, L. M., Aravind, L. 2020. Comprehensive classification of ABC ATPases and their functional radiation in nucleoprotein dynamics and biological conflict systems. *Nucleic Acids Res*. 48(18): 10045-10075.

Kuma, T., Derek, M., Hirvonen, K., Minten, B. 2018. Cash crops and food security: evidence from Ethiopian smallholder coffee producers. *J. Dev. Stud.* 22 p.

Kumar, A. T. 2013. CFSSP: Chou and Fasman Secondary Structure Prediction server. WIDE SPECTRUM: *Research Journal*. 1(9):15-19.

Kumar, S., Singh, R., Kalia, S., Sharma, S. K., Kalia, R. 2016. Recent advances in understanding the role of growth regulators in plant growth and development *in vitro*-I Conventional growth regulators. *Indian Forester*. 142: 459-470.

Kumar, V., Naidu, M. M, Ravishankar, G. A. 2006. Developments in coffee biotechnology in vitro plant propagation and crop improvement. *Plant Cell Tissue and Organ Culture*. 87(1): 49-65.

Kumar, G. P., Sivakumar, S., Siva, G., Vigneswaran, M., Kumar, T. S., Jayabalan, N. 2021. Optimization and establishment of genotype-independent seed-based *in planta* transformation system in cotton (*Gossypium hirsutum* L.cv.SVPR 2). *Plant Gene*, 27(100296): 1-10.

Kuratani, M., Yoshikawa, Y., Bessho, Y., Higashijima, K., Ishii, T., Shibata, R., Takahashi, S., Yutani, K., Yokoyama, S. 2007. Structural basis of the initial binding of tRNA (Ile) lysidine synthetase TilS with ATP and L-lysine. *Structure*. 15(12): 1642-53.

Kuta, D. D and Tripathi, L. 2005. *Agrobacterium* induced hypersensitive necrotic reaction in plant cells: a resistance response against *Agrobacterium*-mediated DNA transfer. *Afr. J. Biotechnol.* 4(8): 752-757.

Kwong, R. W., Bui, A. Q., Lee, H., Kwong, L. W., Fischer, R. L., Goldberg, R. B., Harada, J. J. 2003. LEAFY COTYLEDON1-LIKE defines a class of regulators essential for embryo development. *Plant Cell*. 15: 5–18.

Lambin, E and Geist, H. 2006. *Land-use and Land-Cover Change: Local Processes and Global Impacts*. Springer, 236 p.

Larsson, E., Sitbon, F., Ljung, K., and von Arnold, S. 2008. Inhibited polar auxin transport results in aberrant embryo development in Norway spruce. *New Phytol*. 177: 356–366.

Lashermes, P., Andrzejewski, S., Bertrand, B., Combes, M.-C., Dussert, S., Graziosi, G., Trouslot, P. & Anthony, F. 2000. Molecular analysis of introgressive breeding in coffee (*Coffea arabica* L.). *Theor. Appl. Genet*. 100: 139–146.

Lawit, S. J., Chamberlin, M. A., Agee, A., Caswell, E, S., Albertsen, M. C. 2013. Transgenic manipulation of plant embryo sacs tracked through cell-type-specific fluorescent markers: cell labeling, cell ablation, and adventitious embryos. *Plant Reproduction.* 26*:* 125–137.

Lehmann, M., Siegmund, T., Lintermann, K. G., Korge, G. 1998. The pipsqueak protein of *Drosophila melanogaster* binds to GAGA sequences through a novel DNA-binding domain. *J Biol Chem*. 273(43): 28504-9.

Leljak-Levanic, D., Mihaljevic, S., and Bauer, N. 2015. Somatic and zygotic embryos share common developmental features at the onset of plant embryogenesis. *Acta Physiol. Plant.* 37: 1–14.

Lelu-Walter, M. A., Thompson, D., Harvengt, L., Sanchez, L., Toribio, M., Pâques, L. E. 2013. Somatic embryogenesis in forestry with a focus on Europe: State-of-the-art, benefits, challenges and future direction. *Tree Genet. Genomes*. 9: 883–899.

Leroy, T. and Dufour, M., 2004. *Coffea spp*. genetic transformation. In: Curtis, I.S. (Ed.), Transgenic Crops of the World: Essential Protocols. Kluwer Academic Publishers, *Dordrecht.* pp. 159–170.

Leroy, T., Henry, A. M., Royer, M., Altosaar, I., Frutos, R., Duris, D., Philippe, R. 2000. Genetically modified coffee plants expressing the *Bacillus thuringiensis cry1Ac* gene for resistance to leaf minor. *Plant Cell Rep*. 19: 382–389.

Lescot, M., Déhais, P., Thijs, G., Marchal, K., Moreau, Y., Van de Peer, Y., Rouzé, P., Rombauts, S. 2002. PlantCARE, a database of plant cis-acting regulatory elements and a portal to tools for in silico analysis of promoter sequences. *Nucleic Acids Research*. 30(1): 325–327.

Leshermes, P and F. Anthony. 2007. *Coffee*. C. Kole (Ed.), *Tecnical crops: Genome mapping and molecular breeding in plants*. Springer, 1-13 p.

Liao, C. Y., Smet, W., Brunoud, G., Yoshida, S., Vernoux, T., and Weijers, D. 2015. Reporters for sensitive and quantitative measurement of auxin response. *Nat. Meth*. 12: 207–210.

Liu, C., Yuan, D., Liu, T., Xing, M., Xu, W., Zhang, H., Jin, H., Cai, C., Li, S. 2020. Characterization and Comparative Analysis of RWP-RK Proteins from *Arachis duranensis, Arachis ipaensis,* and *Arachis hypogaea*. *International Journal of Genomics*. 1–19.

Loyola-Vargas, V. M., and Ochoa-Alejo, N. 2016. Somatic embryogenesis. An overview, in Somatic Embryogenesis. Fundamental Aspects and Applications, eds V. M. Loyola-Vargas and N. Ochoa-Alejo (*Cham: Springer*), 1–10.

Loyola-vargas, V. M., Avilez-Montalvo, J. R., Avilés-Montalvo, R. N., Marquez-Lopez, R., Galaz-Avalos, R., and Mellado-Mojica, E. 2016. Somatic embryogenesis in *Coffea spp*, in Somatic Embryogenesis: Fundamental

Aspects and Applications, eds V. M. Loyola-vargas and N. Ochoa-Alejo (*Cham: Springer International Publishing*), 297–318.

Lubabali, A. H., Alakonya, A. E., Gichuru, E. K., Kahia, J. W., Mayoli, R. N. 2014. *In vitro* propagation of the new disease resistant *Coffea arabica* variety, Batian. *Afr J Biotech*. 13: 2414–2419.

Luerûen, H., Kirik, V., Herrmann, P., and Miséra, S. 1998. FUSCA3encodes a protein with a conserved VP1/ABI3-like B3 domain which is of functional importance for the regulation of seed maturation in *Arabidopsis thaliana*. *Plant J*. 15: 755–764.

Maftei, D. E., Nicuta, D., 2013. *Biotehnologii vegetale*. In: Mater, Alma (Ed.), Ghid pentru lucrări practice. Bacău, 182 p.

Malta, M. R., Fassio, L. O., Liska, G. R., Carvalho, G. R., Pereira, A. A., Botelho, C. E., Ferraz, V. P., Silva, A. D., Pedrosa, A. W., Alvaro, L. A., Pereira, R. G. F. A. 2020. Discrimination of genotypes coffee by chemical composition of the beans: potential markers in natural coffees. *Food Research International*. 134: 1-8.

Márquez-López, R. E., Pérez-Hernández, C. A., Kú-González, Á., Galaz-Ávalos, R. M., and Loyola-Vargas, V. M. 2018. Localization and transport of indole-3-acetic acid during somatic embryogenesis in *Coffea canephora*. *Protoplasma*. 255: 695–708.

Méndez-Hernández, H. A., Ledezma-Rodríguez, M., Avilez-Montalvo, R. N., Juarez-Gomez, Y. L., Skeete, A., Avilez-Montalvo, J., De-la-Peña, C., Loyola-Vargas Víctor, M. 2019. Signaling overview of plant somatic embryogenesis. *Front Plant Sci*. 10 (77): 1-15

Michalczuk, L., Cooke, T. J., and Cohen, J. D. 1992. Auxin levels at different stages of carrot somatic embryogenesis. *Phytochemistry*. 31: 1097–1103.

Milton, J. 2020. *25 Top Coffee-Producing Countries in 2020*. (https://elevencoffees.com/top-coffee-producing-countries/). Diakses pada tanggal 5 November 2020.

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

Mishra, M. K. and Slater, A. 2012. Recent advances in the genetic transformation of coffee. Hindawi Publishing Corporation. *Biotechnology Research International*, pp 1–17.

Mishra, M. K. and Sreenath, H, L. 2004. High efficiency *Agrobacterium*-mediated transformation of coffee (*Coffea canephora* Pierre ex Frohner) using hypocotyls explants. In: Proceedings of the 20th International Conference on Coffee Science, Bangalore, India, *ASIC*, pp 792–796.

Mishra, M. K., Devi, S., Mc Cormac, A., Scott, N., Chen, D. F., Elliott, M. & Slater, A. 2010. Green fluorescence protein as a visual selection marker for coffee transformation. *Biologia*. 65: 639–646.

Mishra, M. K., Sreenath, H. L., Jayarama, Mccormac, A. C., Devi, S., Elliott, M. C., and Slater, A. 2008. Two critical factors: *Agrobacterium* strain and antibiotics selection regime improve the production of transgenic coffee plants. In, Proceedings of the 22nd International Association for Coffee Science (ASIC), Campinas, Brazil, pp 843–850.

Mishra, M. K., Sreenath, H. L., Srinivasan, C. S. 2002. *Agrobacterium*-mediated transformation of coffee: An assessment of factors affecting gene transfer efficiency. In: Sreedharan K, Kumar PKV, Jayarama, Chulaki BM (eds) Proceedings of the 15th plantation crops symposium, Mysore, India, pp 251–255.

Mishra, M. K., Suresh, N., Bhat AM, Suryaprakash, N., Kumar, S. S., Kumar, A. & Jayarama. 2011d. Genetic molecular analysis of *Coffea arabica* (Rubiaceae) hybrids using SRAP markers. *Rev Biol Trop.* 59(2): 607–617.

Mitchum, M. G., Yamaguchi, S., Hanada, A., Kuwahara, A., Yoshioka, Y., Kato, T., Tabata, S., Kamiya, Y., Sun, T. P. 2006. Distinct and overlapping roles of two gibberellin 3-oxidases in *Arabidopsis* development. *Plant J*. 45: 804–818.

Moeenfard, M., & Alves, A. 2020. New trends in coffee diterpenes research from technological to health aspects. *Food Research International*. 134: 1-21.

Montalbán, I. A., De Diego, N., Moncaleán, P. 2012. Enhancing initiation and proliferation in radiata pine (*Pinus radiata* D. Don) somatic embryogenesis through seed family screening, zygotic embryo staging and media adjustments. *Acta Physiol. Plant*. 34: 451–460.

Monteiro, M. C and A. Farah. 2012. Chlorogenic acids in Brazilian *Coffea arabica* cultivars from various consecutive crops. *Food Chemistry*. 134 (1): 611-614.

Mori, A. L. B., Kalschne, D. L., Ferrão, M. A. G., Fonseca, A. F. A. D., Ferrão, R. G., & Benassi, M. D. T. 2016. Diterpenes in *Coffea canephora*. *Journal of Food Composition and Analysi.* 52: 52–57.

Muller, J. L. 2000 Indole-3-butyric acid in plant growth and development, *Plant Growth Reg*. 32(2-3): 219-230.

Multiple sequence alignment by Florence Corpet (MultAlin). http://multalin.toulouse.inra.fr/multalin/. Diakses 4 November 2022.

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

Musielak, T. J and Bayer, M. 2014. YODA signalling in the early *Arabidopsis* embryo. *Biochem Soc Trans*. 42(2): 408-412.

Mussatto, S. I., Machado, E. M. S., Martins, S., Teixeira, J. A. 2011. Production, Composition, and Application of Coffee and Its Industrial Residues. *Food and Bioprocess Technology*. 4 (5): 661-672.

Nakanishi, K., Fukai, S., Ikeuchi, Y., Soma, A., Sekine, Y., Suzuki, T., Nureki, O. 2005. Structural basis for lysidine formation by ATP pyrophosphatase accompanied by a lysine-specific loop and a tRNA-recognition domain. *Proc Natl Acad Sci* U S A.102(21): 7487-92.

Navarro, B.V., Elbl, P., De Souza, A. P., Jardim, V., de Oliveira L. F., Macedo, A.F., dos Santos, A. L. W., Buckeridge, M. S., Floh, E. I. S. 2017. Carbohydrate-mediated responses during zygotic and early somatic embryogenesis in the endangered conifer, *Araucaria angustifolia*. *PLoS ONE*. 12(7): 1-20.

National Center for Biotechnology Information (NCBI). https://www.ncbi.nlm.nih.gov/. Diakses 2 November 2022.

Nesper, M., Kueffer, C., Krishnan, S., Kushalappa, C. G., Ghazoul, J. 2019. Simplification of shade tree diversity reduces nutrient cycling resilience in coffee agroforestry. *J. Appl. Ecol.* 56 (1): 119-131.

Neuenschwander, B and Baumann, T. W. 1992. A novel type of somatic embryogenesis in *Coffea arabica*. *Plant Cell Rep*. 10: 608–612.

Nic-Can, G. I. and Loyola-Vargas, V. M. 2016. The Role of the Auxins During Somatic Embryogenesis. In: Loyola-Vargas, V., Ochoa-Alejo, N. (eds) Somatic Embryogenesis: Fundamental Aspects and Applications. Springer, Cham, p 171–182.

Nikolic, R., Mitic, N., Ninkovic, S., Vinterhalter, B., Zdravkovic´-Korac, S. and Nesˇkovic´, M. 2010. Gibberellic acid promotes in vitro regeneration and shoot multiplication in *Lotus corniculatus* L. *Plant Growth Regul*. 62: 181–188.

Novák, O., and Ljung, K. 2017. Zooming in on plant hormone analysis: tissue and cell-specific approaches. *Annu. Rev. Plant Biol*. 68: 323–348.

Odell, J. T., Nagy, F. & Chua, N. H. 1985. Identification of DNA-Sequences Required for Activity of the Cauliflower Mosaic Virus-35s Promoter. *Nature*. 313: 810–812.

Oestreich-Janzen, S. 2013. Chemistry of Coffee. L. Mander, H. W. Liu (Eds.), *Comprehensive Natural Products II*, Elsevier, Oxford. pp. 1085-1117.

Ogita, S., Uefuji, H., Morimoto, M., Sano, H. 2004. Application of RNAi to confirm theobromine as the major intermediate for caffeine biosynthesis in coffee plants with potential for construction of decaffeinated varieties. *Plant Mol Biol*. 54: 931–941.

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

Opabode, J. T. 2006. *Agrobacterium*-mediated transformation of plant: emerging factors that infl uence effi ciency. *Biotechnol. Mol. Biol. Rev.* 1(1): 12-20

Padua, M. S., Paiva, L. V., Silva, L. C., Livramento, K. G., Alves, E., and Castro, A. H. F. 2014. Morphological characteristics and cell viability of coffee plants calli. *Ciênc. Rural*. 44: 660–665.

Pandey, V., Misra, P., Chaturvedi, P., Mishra, M. K., Trivedi, P. K., Tuli, R., 2010. *Agrobacterium tumefaciens*-mediated transformation of *Withania somnifera* (L.) Dunal: an important medicinal plant. *Plant Cell Rep*. 29, 133–141.

Pawłowska, B. 2011. The effect of BA and GA_3 on the shoot multiplication of in vitro cultures of Polish wild roses. *Folia Hort*. 23 (2): 145-149.

Pendergrast, M. 2010. *Uncommon grounds: The history of coffee and how it transformed our world*. (Revised ed.), Basic Books. John Wiley & Sons, Ltd., New York, 1-16 p.

Pereira, A. R., de Carvalho, S. P., Pasqual, M., Santos, F. C. 2007. Embriogênese somática direta em explantes foliares de *Coffea arabica* L. cv. Acaiá Cerrado: efeito de cinetina e ácido giberélico. *Ciênc Agrotec*. 31: 332–336.

Pérez-Pascual, D., Jiménez-Guillen, D., Villanueva-Alonzo, H., Souza-Perera, R., Godoy-Hernández, G., and Zúñiga-Aguilar, J. J. 2018. Ectopic expression of the *Coffea canephora* SERK1 homologue induced differential transcription of genes involved in auxin metabolism and in the developmental control of embryogenesis. *Physiol. Plant*. 163: 530–551.

PlantCare Cis-Acting Regulatory Element. (http://bioinformatics.psb.ugent.be/webtools/plantcare/html/). Diakses 8 November 2022.

Prado, K and Maurel C. 2013. Regulation of leaf hydraulics: from molecular to whole plant levels. *Frontiers in Plant Science*, 4 (255): 1-14.

ProtParam. (https://web.expasy.org/protparam/). Diakses 7 November 2022.

Qaddoury, A and Amssa, M. 2004. Effect of exogenous indole butyric acid on root formation and peroxidase and indole-3-acetic acid oxidase activities and phenolic contents in date Palm offshoots *Bot. Bull. Acad, Syn.* 45: 127-131.

Qianru, L.V., Chen, C., Xu, Y., Hu, S., Wang, L., Sun, K., Chen, X., & Li, X. 2017. Optimization of *Agrobacterium tumefaciens*-mediated transformation systems in tea plant (*Camellia sinensis*). *Horticultural Plant Journal*, 33: 105-9.

Quinga, L. A. P, Heringer, A. S., Pacheco de Freitas Fraga, H., do Nascimento Vieira, L., Silveira, V., Steinmacher, D. A., Guerra, M. P. 2018. Insights into

the conversion potential of Theobroma cacao L. somatic embryos using quantitative proteomic analysis. Sci. Hortic. 229: 65–76.

Quiroz-Figueroa, F. R., Fuentes-Cerda, C. F. J., Rojas-Herrera, R., Loyola-Vargas, V. M. 2002. Histological studies on the developmental stages and differentiation of two different somatic embryogenesis systems of *Coffea arabica*. *Plant Cell Rep*. 20: 1141–1149.

Quiroz-Figueroa, F. R., Méndez-Zeel, M., Sánchez-Teyer, F., Rojas-Herrera, R., and Loyola-Vargas, V. M. 2002. Differential gene expression in embryogenic and non-embryogenic clusters from cell suspension cultures of *Coffea arabica* L. *J. Plant Physiol*. 159: 1267–1270.

Raghavan, V. 2004. Role of 2,4-dichlorophenoxyacetic acid (2,4-D) in somatic embryogenesis on cultured zygotic embryos of *Arabidopsis*: Cell expansion, cell cycling, and morphogenesis during continuous exposure of embryos to 2,4-D. *Am. J. Bot.* 91: 1743–1756.

Rahman, Z. A., Seman, Z. A., Basirun, N., Julkifle, A. L., Zainal, Z., Subramaniam, S. 2011. Preliminary investigations of *Agrobacterium*-mediated transformation in indica rice MR219 embryogenic callus using *gusA* gene. *Afr J Biotechnol*.10(40):7805–13.

Raji, M. R., Lotfi, M., Tohidfar, M., Zahedi, B., Carra, A., Abbate, L., Carimi, F. 2018. Somatic embryogenesis of muskmelon (*Cucumis melo* L.) and genetic stability assessment of regenerants using flow cytometry and ISSR markers. *Protoplasma*. 255: 873–883.

Rani, V., Singh, K. P., Shiran, B., Nandy, S., Goel, S., Devarumath, R. M., Sreenath, H. L. & Raina, S. N. 2000. Evidence for new nuclear and mitochondrial genome organizations among high-frequency somatic embryogenesis derived plants of allotetraploid *Coffea arabica* L. (Rubiaceae). *Plant Cell Rep*. 19: 1013–1020.

Reinert, J. 1958. Morphogenese und ihre Kontrolle an Gewebekulturen aus Carotten. *Naturwissenschaften.* 45: 344–345.

Ribas, A. F., Dechamp, E., Champion, A., Bertrand, B., Combes, M. C., Verdeil, J. L., Lapeyre, F., Lashermes, P., Etienne, H. 2011. *Agrobacterium* mediated genetic transformation of *Coffea arabica* (L.) is greatly enhanced by using established embryogenic callus cultures. *BMC Plant Biology.* 11(92): 1-15.

Ribas, A. F., Kobayashi, A. K., Pereira, L. F. P., Vieira, L. G. E. 2005. Genetic transformation of *Coffea canephora* by particle bombardment. *Biol Plant*. 49: 493–497.

Ribas, A. F., Pereira, L. F. P., Vieira, L. G. E. 2006. Genetic transformation of coffee. *Brazilian Journal of Plant Physiology*.18(1): 83-94.

Riechmann, J. L., Heard, J., Martin, G., Reuber, L., Jiang, C. Z., Keddie, J., Adam, L., Pineda, O., Ratcliffe, O. J., Samaha, R. R., Creelman, R., Pilgrim, M.,

Broun, P., Zhang, J. Z., Ghandehari, D., Sherman, B. K., Yu, G. 2000. *Arabidopsis* transcription factors: genome-wide comparative analysis among eukaryotes. *Science*. 290, 2105–2110.

Rodrigues, N. P and Bragagnolo, N. 2013. Identification and quantification of bioactive compounds in coffee brews by HPLC–DAD–MSn. *Journal of Food Composition and Analysis.* 32 (2), pp. 105-115.

Rojas-Lorz, L., Arrieta-Espinoza, G., Valdez-Melara, M., Pereira, L. F. P., Gatica-Arias, A. 2019. Influence of silver nitrate on somatic embryogenesis induction in Arabica Coffee (*Coffea arabica* L.). *Brazilian Archives of Biology and Technology*. 62: 1-5.

Roowi, S. H., Ho, C. L, Alwee, S. S. R. S., Abdullah, M. O., Napis, S. 2010. Isolation and characterization of differentially expressed transcripts from the suspension cells of oil palm (*Elaeis guineensis* Jacq.) in response to different concentration of auxins. *Mol Biotechnol*. 46:1–19.

Rövekamp, M., Bowman, J. L., Grossniklaus, U. 2016. Marchantia MpRKD regulates the gametophyte–sporophyte transition by keeping egg cells quiescent in the absence of fertilization. *Current Biology*. 26*:* 1–8.

Rusdianto dan Indrianto, A. 2012. Induksi kalus embriogenik pada wortel (*Daucus carota* L.) menggunakan 2,4-dichlorophenoxyacetic acid (2,4-D). *Bionature*. 13(2): 1-5.

Saha, S., Dey, T. and Ghosh, P. 2010. Micropropagation of *Ocimum kilimandscharicum* Guerke (Labiatae), *Acta Biologica Cracoviensia Series Botanica.* 52(2): 50–58.

Salaün, C., Lepiniec, L., Dubreucq, B. 2021. Genetic and Molecular Control of Somatic Embryogenesis. *Plants*, 10(7) 1467: 1-16.

Samper, L. F., Giovanucci, D., Vieira, L. M. 2017. *The powerful role of intangibles in the coffee value chain*. *WIPO Economic Research Papers*. 1-85 p.

Samson, N. P., Campa, C., Noirot, M., De Kochko, A. 2004. Potential use of D-xylose for coffee transformation In: Proceedings of the 20th International Conference on Coffee Science (ASIC), Bangalore, India, pp 707–713.

Sanglard, N. A., Amaral-Silva, P. M., Sattler, M. C., de Oliveira, S. C., Cesário, L. M., Ferreira, A., Carvalho, C. R., Clarindo, W. R. 2019. Indirect somatic embryogenesis in *Coffea* with different ploidy levels: a revisiting and updating study. *Plant Cell Tiss Organ Cult*. 136: 255–267.

Santana-Buzzy, N., Rojas-Herrera, R., Galaz-Ávalos, R. M., Ku-Cauich, J. R., Mijangos Cortés, J., Gutiérrez-Pacheco, L. C., Canto, A., Quiroz-Figueroa, F., Loyola-Vargas, V. M. 2007. Advances in coffee tissue culture and its practical applications. *In Vitro Cell Dev Biol Plant*. 43: 507–520.

Schauser, L., Roussis, A., Stiller, J., Stougaard, J. 1999. A plant regulator controlling development of symbiotic root nodules. *Nature*. 402*:* 191–195.

Schauser, L., Roussis, A., Stiller, J., Stougaard, J. 1999. A plant regulator controlling development of symbiotic root nodules. *Nature*. 402:191-195.

Schauser, L., Wieloch, W., Stougaar, J. 2005. Evolution of NIN-like proteins in *Arabidopsis*, rice, and *Lotus japonicus. Journal of Molecular Evolution.* 60*:* 229–237.

Schievano, E., C. Finotello, E. De Angelis, S. Mammi, L. Navarini. 2014. Rapid Authentication of Coffee Blends and Quantification of 16-O-Methylcafestol in Roasted Coffee Beans by Nuclear Magnetic Resonance. *Journal of Agricultural and Food Chemistry*. 62 (51): 12309-12314.

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

Senbeta, F and M. Denich. 2006. Effects of wild coffee management on species diversity in the Afromontane rainforests of Ethiopia. *For. Ecol. Manag*. 232 (1–3): 68-74.

Seo, H. S., Song, J. T., Cheong, J. J., Lee, Y. H., Lee, Y. W., Hwang, I., Lee, J. S., Choi, Y. D. 2001. Jasmonic acid carboxyl methyltransferase: A key enzyme for jasmonate-regulated plant responses. *Proceedings of the National Academy of Sciences.* 98(8): 4788–4793.

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.

Sharma, T., Modgil, M and Thakur, M. 2007. Factors affecting induction and development of in vitro rooting in apple rootstock. *Indian J. of Exp. Biology* .45: 824-829.

Sharp, W. R., Caldas, L. S., Crocomo, O. J., Mônaco, L. C., Carvalho, A. 1973. Production of *Coffea arabica* callus of three ploidy levels and subsequent morphogenesis. *Phyton*. 31: 67–74.

Shim, K., Blake, K. J., Jack, J., Krasnow, M. A. 2001. The *Drosophila* ribbon gene encodes a nuclear BTB domain protein that promotes epithelial migration and morphogenesis. *Development*. 128(23): 4923-33.

Shiota, H., Satoh, R., Watabe, K., Harada, H., and Kamada, H. 1998. C-AB13, the carrot homologue of the *Arabidopsis* AB13, is expressed during both zygotic and somatic embryogenesis and functions in the regulation of embryospecific ABA-inducible genes. *Plant Cell Physiol*. 39: 1184–1193.

Siegmund, T., Lehmann, M. 2002. The Drosophila Pipsqueak protein defines a new family of helix-turn-helix DNA-binding proteins. *Dev Genes Evol*. 212(3): 152-7.

Silva, A. T., Barduche, D., do Livramento, K. G., and Paiva, L. V. 2015. A putative BABY BOOM-like gene (*CaBBM*) is expressed in embryogenic calli and

embryogenic cell suspension culture of *Coffea arabica* L. *Vitro Cell. Dev. Biol. Plant*. 51: 93–101.

Simões-costa, M. C., Carapuça, E., and Moura, I. R. 2009. Somatic embryogenesis induction in different genotypes of *Coffea spp*. *Acta Hortic*. 812: 295–300.

Singh, P., and Sinha, A. K. 2017. Interplay between auxin and cytokinin and its impact on mitogen activated protein kinase (MAPK), in Auxins and Cytokinins in Plant Biology: Methods and Protocols, eds T. Dandekar and M. Naseem (*New York, NY: Springer*). 93–100.

Singh, R., Kashyap, S.P., Kumari, N., Singh, M. 2016. Regeneration of soapnut tree through somatic embryogenesis and assessment of genetic fidelity through ISSR and RAPD markers. *Physiol. Mol. Biol. Plant.* 22: 381–389.

Sisharmini, A., Ambarwati, A. D., Santoso, T, J., Utami, D. W., dan Herman, M. 2002. Teknik Isolasi DNA dan Analisis PCR Gen *pin*II pada Genom Ubi Jalar. *Prosiding Seminar Hasil Penelitian Ristisan dan Bioteknologi Tanaman.* Balai Penelitian Bioteknologi dan Sumberdaya Genetik Pertanian, 1-8 p.

Sivanandhan, G., Dev, G. K., Theboral, J., Selvaraj, N., Ganapathi, A., Manickavasagam, M., 2015. Sonication, vacuum infiltration and thiol compounds enhance the *Agrobacterium* mediated transformation frequency of *Withania somnifera* (L.) Dunal. *PLoS One* 10(4): 1-23.

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

Soler, C., Sandstrom, C., and Skoog, H. 2017. How can high-biodiversity coffee make it to the mainstream market? The performativity of voluntary sustainability standards and outcomes for coffee diversification. *Environ. Manag*. 59 (2): 230-248.

Sondahl, M. R., and Sharp, W. R. 1977. High frequency induction of somatic embryos in cultured leaf explants of *Coffea arabica L*. *Z. Pflanzenphysiol*. 81: 395–408.

Sondahl, M.R., Spahlinger, D., Sharp, W.R., 1979. A histological study of high frequency and low frequency induction of somatic embryos in cultured leaf explants of *Coffea arabica* L. *Z. Pflanzenphysiol*. 94 (2): 101–108.

Sonia, Saini, R., Singh, R. P., Jaiswal, P. K., 2007. *Agrobacterium tumefaciens* mediated transfer of *Phaseolus vulgaris* α-amylase inhibitor-1 gene into mungbean: *Vigna radiate* (L.) Wilczek using bar as selectable marker. *Plant Cell Rep*. 26, 187–198.

Sood, P., Singh, R. K., Prasad, M., 2020. An efficient *Agrobacterium*-mediated genetic transformation method for foxtail millet (*Setaria italica* L.). *Plant Cell Rep*. 39 (4): 511–525.

Sridevi, V., Giridhar, P., Simmi, P. S., Ravishankar, G. A. 2010. Direct shoot organogenesis on hypocotyl explants with collar region from in vitro seedlings of *Coffea canephora* Pierre ex. Frohner cv. CXR and *Agrobacterium tumefaciens*-mediated transformation. *Plant Cell Tissue Organ Cult*. 101: 339–347.

Stachel, S. E., Nester, E. W., Zambryski, P. C., 1986. A plant cell factor induces *Agrobacterium tumefaciens* vir gene expression. *Proc. Natl. Acad. Sci*. U. S. A. 83: 379–383.

Staritsky, G. 1970. Embryoid formation in callus tissues of coffee. *Acta Bot. Neerl.* 19: 509–514.

Steiner, N., Santa-Catarina, C., Guerra, M., Cutri, L., Dornelas, M., and Floh, E. 2012. A gymnosperm homolog of SOMATIC EMBRYOGENESIS RECEPTOR-LIKE KINASE-1 (SERK1) is expressed during somatic embryogenesis. *Plant Cell Tissue Organ Cult*. 109: 41–50.

Steward, F. C., Ammirato, P. V. & Mapes, M. O. 1970. Growth and development of totipotent cells some problems, procedures, and perspectives. *Ann. Bot.* 34: 761–787.

Steward, F.C., Mapes, M.O., Mears, K. 1958. Growth and Organized Development of Cultured Cells. II. Organization in Cultures Grown from Freely Suspended Cells. *Am. J. Bot*. 45: 705–708.

Su, Y. H., Tang, L. P., Zhao, X. Y., Zhang, X. S. 2020. Plant cell totipotency: Insights into cellular reprogramming. *Journal of Integrative Plant Biology*, 63(1): 228-243.

Sujatha, M. and Visarada, K. 2013. Biolistic DNA delivery. In: Sudowe, S, Reske-Kunz, AB (Eds.), Transformation of Nuclear DNA in Meristematic and Embryogenic Tissues. *Springer*, NewYork, pp. 27–44.

Suzuki, R., Shindo, H., Tase, A., Kikuchi, Y., Shimizu, M., Yamazaki, T. 2009. Solution structures and DNA binding properties of the N-terminal SAP domains of SUMO E3 ligases from *Saccharomyces cerevisiae* and *Oryza sativa*. *Proteins*. 75(2): 336-47.

Syakir, M. & Surmaini, E. 2017. Perubahan Iklim Dalam Konteks Sistem Produksi Dan Pengembangan Kopi Di Indonesia / Climate Change in the Contex of Production System and Coffee Development in Indonesia. *Jurnal Penelitian dan Pengembangan Pertanian*. 36: 77-90.

Taiz, L and Zeiger, E. 2010. *Plant Physiology 5th Edition*. Sinauer Associates Inc., Sunderland, Massachusetts, USA, 782 p.

Tamura, K., Peterson, D., Peterson, N., Stecher, G., Nei, M., Kumar, S. 2011. MEGA5: Molecular Evolutionary Genetics Analysis Using Maximum Likelihood, Evolutionary Distance, and Maximum Parsimony Methods, *Molecular Biology and Evolution*. 28(10): 2731–2739.

Tamura, K., Stecher, G., Peterson, D., Filipski, A., Kumar, S. 2013. MEGA7: Molecular Evolutionary Genetics Analysis Version 7.0. *Molecular Biologi and Evolution*. 30: 2725-2729.

Tedeschi, F., Rizzo, P., Rutten, T., Altschmied, L., & Bäumlein, H. 2017. RWP-RK domain-containing transcription factors control cell differentiation during female gametophyte development in *Arabidopsis. New Phytologist,* 213(4): 1909–1924.

Thakare, D., Tang, W., Hill, K., and Perry, S. E. 2008. The MADS-domain transcriptional regulator AGAMOUS-Like 15 promotes somatic embryo development in *Arabidopsis* and soybean. *Plant Physiol*. 146: 1663–1672.

The MEME Suite. (http://meme-suite.org/). Diakses 5 November 2022.

Tonietto, Â., Sato, J. H., Teixeira, J. B., de Souza, E. M., Pedrosa, F. O., Franco, O. L., Mehta, A. 2012. Proteomic analysis of developing somatic embryos of *Coffea arabica*. *Plant Mol. Biol. Report*. 30: 1393–1399.

Toonen, M. A. J., Hendriks, T., Schmidt, E. D. L., Verhoeven, H. A., Van Kammen, A., and De Vries, S. C. 1994. Description of somatic-embryoforming single cells in carrot suspension cultures employing video cell tracking. *Planta*. 194: 565–572.

Torres, L. F., Diniz, L. E. C., do Livramento, K. G., Freire, L. L., Paiva, L. V. 2015. Gene expression and morphological characterization of cell suspensions of *Coffea arabica* L. cv. Catiguá MG2 in different cultivation stages. *Acta Physiologiae Plantarum.* 37(175): 1-8.

Trontin, J. F., Klimaszewska, K., Morel, A., Hargreaves, C., and Lelu-Walter, M. A. 2016. Molecular aspects of conifer zygotic and somatic embryo development: a review of genome-wide approaches and recent insights, in *In Vitro* Embryogenesis in Higher Plants, eds M. A. Germanà and M. Lambardi (*New York, NY: Springer*). 167–207.

van Boxtel, J., and Berthouly, M. 1996. High frequency somatic embryogenesis from coffee leaves. *Plant Cell Tissue Organ Cult*. 44: 7–17.

van Boxtel, J., Berthouly, M., Carasco, C., Dufour, M., Eskes, A.1995. Transient expression of beta-glucuronidase following biolistic delivery of foreign DNA in to coffee. *Plant Cell Rep.* 14: 748–752.

van der Vossen, H., Bertrand, B., and Charrier, A. 2015. Next generation variety development for sustainable production of arabica coffee (*Coffea arabica* L.): a review. *Euphytica.* 204: 243–256.

Vogt, M. 2011. Tico Time: the Influence of Coffee Certifications on Sustainable Development and Poverty Reduction in Costa Rica: a Discussion with Coffee Farmers and Cooperative managers. PhD Thesis. Flinders University.

Vogt, M. 2019c. *Juggling sustainability certifications in the Costa Rican coffee industry*. M. Vogt (Ed.), *Sustainability Certification Schemes in the*

Agricultural and Natural Resource Sectors: Outcomes for Society and the Environment. Earthscan Studies in Natural Resource Management, Taylor and Francis, New York and London, pp. 230-258.

Vogt, M. 2019d. *Variance in Approach toward A 'Sustainable' Coffee Industry in Costa Rica: Perspectives from within, Lessons and Insights*. Ubiquity Press, London, 244 p.

Vogt, M. A. B. 2020. Developing stronger association between market value of coffee and functional biodiversity. *Journal of Environmental Management*. 269(110777): 1-13.

von Arnold, S., Sabala, I., Bozhkov, P., Dyachok, J. & Filonova, L. 2002. Developmental pathways of somatic embryogenesis. *Plant Cell Tiss. Org. Cult.* 69: 233–249.

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 embryogenesis. *Current Biology*. 21*:* 1277–1281.

Wendrich, J. R., & Weijers, D. 2013. The *Arabidopsis* embryo as a miniature morphogenesis model. *New Phytologist*. 199(1): 14–25.

Wermelinger, D'Ambrosio, L., Klopprogge, B., Yeretzian, C. 2011. Quantification of the Robusta fraction in a coffee blend via Raman spectroscopy: Proof of principle. *Journal of Agricultural and Food Chemistry*. 59 (17): 9074-9079.

Wijayati, A., Solichatun dan Sugiyarto. 2005. Pengruh asam indol asetat terhadap pertumbuhan dan diamteter sel sekretori rimpang tanaman kunyit (Curcuma domestica Val.). *Biofarmasi*, 3(1): 16 -21.

Winkelmann, T. 2016. Somatic versus zygotic embryogenesis: learning from seeds, in In Vitro Embryogenesis in Higher Plants, eds M. A. Germanà and M. Lambardi (*New York, NY: Springer)*. 25–46.

Wójcikowska, B., and Gaj, M. D. 2017. Expression profiling of AUXIN RESPONSE FACTOR genes during somatic embryogenesis induction in *Arabidopsis*. *Plant Cell Rep.* 36: 843–858.

Xiao, Y., Chen, Y., Ding, Y., Wu, J., Wang, P., Yu, Y., Wei, X., Wang, Y., Zhang, C., Li, F., Ge, X. 2018. Effects of GhWUS from upland cotton (*Gossypium hirsutum L.*) on somatic embryogenesis and shoot regeneration. *Plant Sci*. 270: 157–165.

Yang, G., Shen, X., Jackson, R and Lu, Z. (C). 2013. Factors affecting in vitro seed germination and shoot proliferation of galax (*Galax urceolata* (Poir.) Brummitt). *Aust. J. Crop Sci.* 7(11): 1766-1771.

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

Yang, X., Zhang, X., Yuan, D., Jin, F., Zhang, Y., and Xu, J. 2012. Transcript profiling reveals complex auxin signalling pathway and transcription

regulation involved in dedifferentiation and redifferentiation during somatic embryogenesis in cotton. *BMC Plant Biol.* 12(110): 1-19.

Yusnita. 2015. *Kultur Jaringan Tanaman: Sebagai Teknik Penting Bioteknologi Untuk Menunjang Pembangunan Pertanian*. Universitas Lampung. Bandar Lampung, 86 p.

Yasuda, T., Fujii, Y., Yamaguch, T. 1985. Embryogenic callus induction from *Coffea arabica* leaf explants by benzyladenine. *Plant Physiol*. 26: 595–597.

Yi-Chieh, W., Meng-Ze, L., Bin, H., Hsiao-Hang, C., Jen-Tsung, C. 2018. Thidiazuron enhanced somatic embryogenesis from callus lines of arabica coffee and subsequent plant regeneration. *Acta Biologica Cracoviensia Series Botanica*. 60: 35-44.

Zakia, S., Zahid, N. J., Yaseen, M., Abbasi, N. A., Hafiz, A. A. and Mahmood, N. 2013. Standardization of micropropgation techniques for *Aloe vera*: A pharmaceutically important plant *Pak. J. Pharm. Sci.* 26(6): 1083-1087.

Zamarripa, C. A., Ducos, J. P., Tessereau H., BolloN, H., Eskes, A. B., Pétiard, V. 1991. Devéloppement d'un procédé de multiplication en masse du caféier par embryogenèse somatique en milieu liquide, Paris; In: 14è Colloque Scientifique Internationale sur le Café, Association Scientifique Internationale du Café, pp 392–402.

Zhai, L., Xu, L., Wang, Y., Zhu, X., Feng, H., Li, C., Luo, X., Everlyne, M. M. & Liu, L. 2016. Transcriptional identification and characterization of differentially expressed genes associated with embryogenesis in radish (*Raphanus sativus* L.). *Sci. Rep*. 6(21652): 1-13.

Zhang, Q., Liang, Z., Cui, X., Ji, C., Li, Y., Zhang, P., Liu, J., Riaz, A., Yao, P., Liu, M., Wang, Y., Lu, T., Yu, H., Yang, D., Zheng, H., Gu, X. 2018. N6-Methyladenine DNA methylation in Japonica and Indica rice genomes and its association with gene expression, plant development, and stress responses. *Molecular Plant*.11(12): 1492–1508.

Zhao, P., Begcy, K., Dresselhaus, T., and Sun, M. X. 2017. Does early embryogenesis in eudicots and monocots involve the same mechanism and molecular players? *Plant Physiol.* 173: 130–142.

Zimmerman, J. L. 1993. Somatic embryogenesis: a model for early development in higher plants. *Plant cell.* 5: 1411–1423.

Zulwanis, Setiari, N., Gutierrez-Marcos, J., Semiarti, E. 2020. The Expression of *AtRKD4* Transgene During Induction of Somatic Embryogenesis in Transgenic *Dendrobium phalaenopsis* Orchid Carrying *35S::GR::AtRKD4*. *AIP Conference Proceedings*. pp 1-7.

Żur, I., Dubas, E., Krzewska, M., WaligoÂrski, P., Dziurka, M., Janowiak, F. 2015. Hormonal requirements for effective induction of microspore embryogenesis

in triticale (× *Triticosecale* Wittm.) anther cultures. *Plant Cell Reports*, 34: 47-62.

Zürcher, E. and Müller, B. 2016. Cytokinin Synthesis, Signaling, and Function--Advances and New Insights. *International Review of Cell and Molecular Biology*, 324: 1-38.