

## DAFTAR PUSTAKA

- Abdel-Hameed, U.K., Tantawy, M.E., Salim, M.A., Mourad, M.M., and Ishak, I.F. 2015. Phenetic analysis of morphological and molecular traits in Acanthaceae Juss. *Journal of Biosciences and Medicines*, 3: 18-34.
- Ajibade, S. R., Weeden, N.F., and Chite, S.M. 2000. Inter-simple sequence repeat analysis of genetic relationships in the genus *Vigla*. *Euphytica*, 111: 47-55.
- Ali, N., Rampazzo, R.d.C.P., Costa, A.D.T., and Krieger, M.A. 2017. Current nucleic acid extraction methods and their implications to point-of-care diagnostic. *BioMed Research International* Volume 2017, Article ID 9306564, 13 pages ([doi: 10.1155/2017/9306564](https://doi.org/10.1155/2017/9306564)).
- Aljanabi, M.S., Forget, L., and Dookun, A. 1999. An improved and rapid protocol for the isolation of polysaccharide and polyphenol free sugarcane DNA. *Plant Mol. Biol. Rep.*, 17:1–8
- Amani, J., Kazemi, R., Abbasi, A.R., and Salmanian, A.H. 2011. A simple and rapid leaf genomic DNA extraction method for polymerase chain reaction analysis. *Iran J. Biotech.*, 9: 69.
- Andersson, L. 1985a. Revision of *Heliconia* subgen. *Stenochlamys* (Musaceae - Heliconioideae). *Opera. Bot.*, 82: 1-124.
- \_\_\_\_\_. 1985b. *Musaceae*. pp. 80-85. In Harling, G., and Sparre, B. (Eds.) *Flora of Ecuador*. Publishing House of Swedish Research Councils, Stockholm.
- \_\_\_\_\_. 1986. Revision of *Maranta* subgen. *Maranta* (Marantaceae). *Nord. J. Bot.*, 6: 729-756. Copenhagen.
- \_\_\_\_\_. 1988. *Marantaceae*. pp 278–293. In Kubitzki, K. (Eds.). *The families and genera of vascular plants IV. Flowering plants – Monocotyledons: Alismatanae and Commelinanae (except Gramineae)*. Springer-Verlag, Berlin.
- Ansari, S.A., Narayanan, C., Wali, S.A., Kumar, R., Shukla, N., and Rahangdale, S.K. 2012. ISSR markers for analysis of molecular diversity and genetic structure of Indian teak (*Tectona grandis* Lf) populations. *Annals of Forest Research*, 55(1): 11-23.
- Anshary, H., Sriwulan, Freeman, M.A., and Ogawa, K. 2014. Occurrence and molecular identification of *Anisakis* Dujardin, 1845 from Marine Fish in Southern Makassar Strait, Indonesia. *Korean Journal Parasitol.*, 52: 9-19.
- Anne C. 2006. Choosing the right molecular genetic markers for studying biodiversity: from molecular evolution to practical aspects. *Genetica*, 127: 101–120.
- Aprianita, A., Vasiljevic, T., Bannikova, A., and Kasapis, S. 2014. Physicochemical properties of flours and starches derived from traditional Indonesian tubers and roots. *Journal of Food Science and Technology*, 51: 3669-3679.
- Aragaw, M., Alamerew, S., Michael, G., and Tesfaye, A. 2011. Variability of ginger (*Zingiber officinale* Roscoe.) accessions for morphological and some quality traits in Ethiopia. *International Journal of Agricultural Research*, 6(6): 444-457.

- Asha, K.I., Radhika, N.K., Vineetha, B., Devi, A.A., Sheela, M.N., and Sreekumar, J. 2015. Diversity analysis of arrowroot (*Maranta arundinacea* L.) germplasm using ISSR markers. *Journal of Root Crops*, 14(1): 17-24.
- Badan Ketahanan Pangan. 2005. *Garut (Maranta arundinacea L.)*. Brochure. Badan Ketahanan Pangan Provinsi Jawa Timur, Surabaya.
- Bai, H., Song, Z., Zhang, Y., Li, Z., Wang, Y., Liu, X., Ma, J., Quan, J., Wu, X., Liu, M., Zhou, J., Dong, Z., and Li, D. 2020. The bHLH transcription factor PPLS1 regulates the color of pulvinus and leaf sheath in foxtail millet (*Setaria italica*). *Theoretical and Applied Genetics*, 1-16.
- Bani, P.W., Daryono, B.S., and Purnomo. 2017. Penanda molekuler *Inter Simple Sequence Repeat* untuk menentukan ketahanan tanaman jagung terhadap penyakit bulai. *Jurnal Fitopatologi Indonesia*, 13(4): 127-135.
- BAPPEDA, n.d. *Peta Bentuk Lahan – GIS*. (<http://bappeda.jogjaprov.go.id/dataku/peta/detail/2-peta-bentuk-lahan>) diakses pada 25 Januari 2021.
- Barai, A., and Drey, L. 2017. Outlier detection and removal algorithm in K-means and hierarchical clustering. *World Journal of Computer Application and Technology*, 5(2): 24-29.
- Baroni-Urbani, C., and Buser, M.W. 1976. Similarity of binary data. *Syst. Zool.*, 25: 251–259.
- BB BioGen. 2017. *Katalog Plasma Nutfah Patat (Maranta arundinacea L.) Balai Besar Penelitian dan Pengembangan Bioteknologi dan Sumberdaya Genetik Pertanian*. Brochure. BB BioGen, Bogor.
- Bellon, M.R., and Brush, S.B. 1994. Keepers of the maize in Chiapas, Mexico. *Economic Botany*, 48:196-209.
- Berghuijs, H.N.C., Yin, X., Ho, Q.T., van der Putten, P.E.L., Verboven, P., Retta, M.A., Nicolai, B.M., and Struik, P.C. 2015. Modelling the relationship between CO<sub>2</sub> assimilation and leaf anatomical properties in tomato leaves. *Plant Science* (doi: [10.1016/j.plantsci.2015.06.022](https://doi.org/10.1016/j.plantsci.2015.06.022))
- Bhandari, H.R., Bhanu, A.N., Srivastava, K., Singh, M.N., Shreya, and Hermantaranjan, A. 2017. Assessment of genetic diversity in crop plants – an overview. *Adv Plants Agric Res.*, 7(3):279–286.
- Blair, M.W., Panaud, O., and McCouch, S.R. 1999. Inter-simple sequence repeat (ISSR) amplification for analysis of microsatellite motif frequency and fingerprinting in rice (*Oryza sativa* L). *Theor. Appl. Genet.*, 98: 780-792.
- Bornet B, Branchard M. 2001. Nonanchored inter simple sequence repeat (ISSR) markers: Reproducible and specific tools for genome fingerprinting. *Plant Molecular Biology Reporter* 19:209–215.
- Brito, V., Nascimento, R., Narcisa-Oliveira, J., Joffer, N., Fattori, A., Cereda, M., et al. 2021. Arrowroot (*Maranta arundinacea* L.): *Botany, Horticulture, and Uses*. pp. 233-273. In Warrington, I. (Eds.). *Horticultural Reviews Volume 48*. John Wiley & Sons, Inc., Hoboken, NJ.
- Brodersen, C. 2008. The Absorption and Utilization of Direct, Diffuse and Low Angle Light by Plant Leaves. *Dissertations and Theses*. Graduate College
- Bryant, R.H., Matthew, C., and Hodgons, J. 2015. Growth strategy of rhizomatous and non-rhizomatous tall fescue populations in response to defoliation. *Agriculture*, 5: 791-805.

- Burgess, A.J., Retkute, R., Preston, S.P., Jensen, O.E., Pound, M.P., Pridmore, T.P. and Murchie, E.H. 2016. The 4-dimensional plant: effects of wind-induced canopy movement on light fluctuations and photosynthesis. *Front. Plant Sci.*, 7: 1392. (doi: [10.3389/fpls.2016.01392](https://doi.org/10.3389/fpls.2016.01392))
- Calixto, E.S., Lange, D., and Del-Claro, K. 2015. Foliar anti-herbivore defences in *Qualea multiflora* Mart. (Vochysiaceae): changing strategy according to leaf development. *Flora*, 212:19–23.
- Caldas, L.S., Lu`ttge, U., Franco, A.C., and Haridansan, M. 1997. Leaf heliotropism in *Pterodon pubescens*, a woody legume from the Brazilian cerrado. *Rev. Brasil. Fisiol. Veg.*, 9: 1–7.
- Carlsward, B.S., Stern, W.L., and Bytebier, B. 2006. Comparative vegetative anatomy and systematics of the angraecoids (Vandaeae, Orchidaceae) with an emphasis on the leafless habit. *Bot. J. Linn. Soc.*, 151: 165-218.
- Cartono, 2005. *Penuntun Praktikum Ekologi Tumbuhan*. Universitas Pasundan, Bandung
- Çelik Ö, Atak, Ç., and Suludere, Z. 2018. Comparative transcriptional profiling of soybean orthologs of *Arabidopsis* trichome developmental genes under salt stress. *Plant Mol. Biol. Report.*, 36: 82–93.
- Cereda, M.P. 2002. *Importância das tuberosas tropicais* [Importance of tropical tubers]. pp 13-25. In Cereda, M.P. (Eds.) *Agricultura: Tuberosas Amiláceas Latino Americanas, vol. 2* [Agriculture: Latin America Tuberous Amylacea, vol. 2]. Cargill, São Paulo.
- Chase, M.W., Soltis, D.E., Olmstead, R.G., Morgan, M., Les, D.H., Mishler, B.D., Duvall, M.R., Price, R.A., Hills, H.G., Qui, Y-L., Kron, K.A., Rettig, J.H., Conti, E., Palmer, J.D., Manhart, J.R., Sytsma, K.J., Michaels., H.J., Kress, W.J., Karol, K.G., Clark, W.D., Hedren, M., Gaut, B.S., Jansen, R.K., Kim, C.F. Wimpee, J.F. Smith, G.R. Furnier, Strauss S.H., Xiang, Q-Y., Plunkett, K-J., Soltis, G.M., Swensen, P.S., Williams S.M., Gadek, P.A., Quinn, C.J., Eguiarte, L.E., Golenberg, E., Learn, G.H., Jr., Graham, S.W., Barrett, S.C.H., Dayanandan, S., and Albert, V.A. 1993. Phylogenetics of seed plants: an Analysis of nucleotide sequences from the plastid gene *rbcl*. *Annals of the Missouri Botanical Garden*, 80:528-580.
- Chomicki, G. 2013. Analysis of rhizome morphology of the Zingiberales in Payamino (Ecuador) reveals convergent evolution of two distinct architectural strategies. *Acta Botanica Gallica*, 160(3-4): 239-254.
- Choudhuri, S. 2014. *Bioinformatics for Beginners: Genes, Genomes, Molecular Evolution, Databases and Analytical Tools*. Elsevier. pp 1-22
- Claßen-Bockhoff, R. 1991. Untersuchungen zur Konstruktion des Bestäubungsapparates von *Thalia geniculata* (Marantaceen) [Investigations into the construction of the *Thalia geniculata* (Marantaceae) pollinators]. *Botanica Acta*, 104: 183–193.
- Claßen-Bockhoff, R., dan Heller A. 2008a. Floral synorganisation and secondary pollen presentation in four Marantaceae from Costa Rica. *International Journal of Plant Science*, 169: 745–760.
- \_\_\_\_\_. 2008b. Style release experiments in four Marantaceae from the Golfo Dulce area in Costa Rica. *Stapfia*, 88: 557–571.
- Clark. M.S. 1997. *Plant Molecular Biology- A Laboratory Manual*. Springer, New York, pp 305–328.

- Clifford, H.T. 1976. Dendrograms and their interpretation. pp 96-101. In W. T. Williams (Eds.). *Pattern analysis in agricultural science*. C.S.I.R.O., Melbourne, and Elsevier, Amsterdam.
- Clifford, H.T., and Williams, W.T. 1973. Classificatory dendrograms and their interpretation. *Australian J. Bot.*, 21: 151-162.
- Coelho, I.S., 2003. *Efeito da consorciação e da adubação orgânica sobre a cultura da araruta (Maranta arundinacea L.)* [Effect of intercropping and organic fertilization on arrowroot crop]. Dissertation. Universidade Federal Rural do Rio de Janeiro, Brazil. pp. 1-45.
- Colombo, J.N., Vieira, J.C.B., Krause, M.R., Puiatti, M., and Haddade, I.R. 2019. Evaluation of arrowroot agronomic performance (*Maranta arundinacea* L.) 'Seta' intercropped with sunn hemp. *Revista de Ciências Agroveterinárias*, 18 (1): 65-72.
- Costa, F.R.C., Espinelli, F.P., and Figueiredo, F.O.G. 2008. *Guide to the Marantaceae of the Reserva Ducke and Reserva Biológica do Uatumã*. Inpa, Manaus. pp. 1-154.
- Cote, G.G. 1995. Signal transduction in leaf movement. *Plant Physiol*, 109: 729–734.
- Cramer, H. 1946. *Mathematical methods of statistics*. Princeton University Press, Princeton.
- Croxdale, J. 2000. Stomatal patterning in angiosperms. *American Journal of Botany*, 87: 1069–1080.
- Daquinta, M., Brown, K., Silva, J.A.T., and Sagarra, F. 2009. In vitro propagation of arrowroot (*Maranta arundinacea* L.). *International Journal of Plant Development Biology*, 3(1): 15-17.
- Deswina, P., Prihastuti, L., and Saputra, A. 2019. Cytomorphological characteristic evaluation of the third generation of arrowroot plant (*Maranta arundinacea* L.) radiated by gamma ray. *Jurnal Agro*, 6(2), 181-195.
- Dill, N.H. 1960. Sleep movements of the prayer plant *Maranta leuconeura* Morren. *Bios.*, 31(3): 149–157.
- Djaafar, T.F., Rahayu, S., and Sarjiman. 2006. Karakteristik rimpang garut (*Maranta arundinacea* L.) pada berbagai umur panen dan produk olahannya [Characteristics of arrowroot (*Maranta arundinacea* L.) rhizomes at various harvest ages and their processed products]. *Prosiding Seminar Nasional IPTEK Solusi Kemandirian Bangsa, Yogyakarta 2-3 Agustus 2006*. LIPI – BPTP Provinsi D.I. Yogyakarta – Fakultas Biologi Universitas Gadjah Mada, Yogyakarta.
- Djaafar, T.F., Sarjiman, and Pustika, A.B. 2010. Pengembangan budi daya tanaman garut dan teknologi pengolahannya untuk mendukung ketahanan pangan. *Jurnal Litbang Pertanian*, 29(1): 01-10.
- Djaafar, T.F., Sarjiman, Rahayu, S., Arlyna, B.P., Murwati, Catur, P., Mujahit, M., Sulasmi, Sumisih, and Murdiman. 2007. Pengkajian sistem usaha tanaman umbi-umbian spesifik lokasi untuk menunjang agroindustri. *Laporan Kegiatan*. Balai Pengkajian Teknologi Pertanian Yogyakarta.
- Duncan, N., Pearsall, D., and Benfer, R. 2009. Gourd and squash artifacts starch yield grains of feasting foods from preceramic Peru. *Proceedings of the National Academy of Sciences of the United States of America*, 106(32): 13202-13206.

- Efloras, n.d. *Flora of China*. (<http://www.efloras.org/florataxon.aspx?flora>)  
Diakses pada 8 Agustus 2019.
- Efloras, n.d. *Flora of North America*. (<http://www.efloras.org/florataxon.aspx>)  
Diakses pada 8 Agustus 2019.
- Fang, D.Q., and Roose, M.L. 1997. Identification of closely related citrus cultivars with inter-simple sequence repeat markers. *Theor. Appl. Genet.*, 95: 408-417.
- Faraldo, M.I.F., Silva, R.M., Ando, A., and Veasey, E.A. 2003. *Molecular markers in cassava*. pp 100-117. In Cereda, M.P. (Eds.). *Agricultura. Culturas de tuberosas amiláceas Latino-Americanas*. Fundação Cargill, São Paulo, Brasil.
- Feng, L., Raza, M.A., Li, Z., Chen, Y., Khalid, M.H.B., Du, J., Liu, W., Wu, X., Song, C., Yu, L., Zhang, Z., Yuan, S., Yang, W., and Yang, F. 2019. The Influence of Light Intensity and Leaf Movement on Photosynthesis Characteristics and Carbon Balance of Soybean. *Front. Plant Sci.* 9: 1952. (doi: 10.3389/fpls.2018.01952).
- Flach, M. and Rumawas. 1996. *Maranta arundinacea* L., *Prosea 9: Plants yielding non seed carbohydrates*. Bogor. pp 113-116.
- Francis, B. and Gilman, R.T. 2019. Light intensity affects leaf morphology in a wild population of *Adenostyles alliariae* (Asteraceae). *Italian Botanist* 8: 35-45. ([doi.org/10.3897/italianbotanist.8.39393](https://doi.org/10.3897/italianbotanist.8.39393)).
- Franklin, K.A., and Quail, P.H. 2010. Phytochrome functions in Arabidopsis development. *J. Exp. Bot.* 61, 11–24.
- Fujii, A., Nakamura, S., and Goto, Y. 2014. Relation between stem growth processes and internode length patterns in sorghum cultivar ‘Kazetachi’. *Plant Production Science*, 17(2): 185-193.
- Galdon-Armero, J., Fullana-Pericas, M., Mulet, P.A., Conesa, M.A., Martin, C., and Galmes, J. 2018. The ratio of trichomes to stomata is associated with water use efficiency in *Solanum lycopersicum* (tomato). *Plant. J.*, 96: 607–619.
- Glimn-Lacy, J. and Kaufman, P.B. 2006. *Arrowroot Family (Marantaceae)*. In *Botany Illustrated*. Springer, Boston. pp 124-124.
- Gotoh, E., Suetsugu, N., Higa, T., Matsushita, T., Tsukuya, H., Wada, M. 2018. Palisade cell shape affects the light-induced chloroplast movements and leaf photosynthesis. *Sci. Rep.* 8: 1472, (doi: [10.1038/s41598-018-19896-9](https://doi.org/10.1038/s41598-018-19896-9))
- Govindaraj, M., Vetriventhan, M., and Srinivasan, M. 2015. Importance of genetic diversity assessment in crop plants and its recent advances: an overview of its analytical perspectives. *Genetics Research International*, Volume 2015: 1–14.
- Gracie, A.J., Brown, P.H., and Clark, R.J. 2004. Study of some factors affecting the growth and development of myoga (*Zingiber mioga* Roscoe). *Scientia Horticulturae*, 100: 267-278.
- Grammatikopoulos, G., Karabourniotis, G., Kyparissis, A., Petropoulou, Y., and Manetas, Y. 1994. Leaf hairs of olive (*Olea europaea* L.) prevent stomatal closure by ultraviolet-B radiation. *Aust. J. Plant Physiol.*, 21: 293–301.
- Guilherme, D.d.O., Branco, F.P., Madeira, N.R., Brito, V.H., de Oliveira, C.E., Jadoski, C.J., and Cereda, M.P. 2017. *Chapter 5; Starch Valorization From Corm, Tuber, Rhizome, and Root Crops: The Arrowroot (Maranta*

- arundinacea* L.) Case. pp. 167-222. In Clerici, M.T.P.S., and Schiemele, M. (Eds.) *Starches for Food Application*. Elsevier Inc., Netherlands
- Guilherme, D.d.O., Reis, L.K., Prado, N.F., Arruda, M.W.G., Morais, D.P., and Cereda, M.P. 2019. Production arrowroot depending on the size of the rhizome and substrate in Campo Grande, Brazil. *International Journal of Environmental and Agriculture Research*, 3(1): 132-135.
- Hai-Yu, F., Wang, N., Ming-He, W., Chu, Y., and Dong, M. 2008. Adaptation of Rhizome Connections in Drylands: Increasing Tolerance of Clones to Wind Erosion. *Annals of Botany*, 102(4): 571–577.
- Haliapas, S., Yupsanis, T.A., Syros, T.D., Kofidis, G., and Economou, A.S. 2008. *Petunia* × *hybrida* during transition to flowering as affected by light intensity and quality treatments. *Acta Physiol. Plant.*, 30: 807–815.
- Hammel, B.E. 1986. The vascular flora of La Selva biological station, Costa Rica. Marantaceae. *Selbyana*, 9(1): 234-242.
- Hammel, B.E., Grayum, M.H., Herrera, C., and Zamora, N. 2014. *Manual de Plantas de Costa Rica* [Costa Rica Plant Manual]. Missouri Botanical Garden Press, pp 78-80.
- Hammer, K. and Morimoto, Y. 2011. *Classification of Intraspecific Variation in Crop Plants*. pp 40-43. In Guarino, L. et.al. (Eds.). *Collecting Plants Genetic Diversity: Technical Guidelines Biodiversity International*.
- Haryjanto, L., Prastyono, and Yuskianti, V. 2014. Variasi pertumbuhan dan parameter genetic pada tiga plot uji keturunan nyawai (*Ficus variegata* Blume) di Bantul [Growth variation and genetic parameters in the three Nyawai lineage test plots in Bantul]. *Jurnal Pemuliaan Tanaman Hutan*, 8(3): 137-151.
- Henriot, C.P., Cuenot, Q., Levrey, L-H., Loup, C., Chiarello, L., Masclaux, H., and Bornette, G. 2019. Relationships between key functional traits of the waterlily *Nuphar lutea* and wetland nutrient content. *Peer. J.*, 7: 7861 (doi: 10.7717/peerj.7861).
- Heredia-Zárate, N.A., and Vieira, M.C. 2005. Produção da araruta 'comum' proveniente de três tipos de propágulos [Production of the 'comum' arrowroot from three types of propagules]. *Ciência e Agrotecnologia*, 29(5): 995-1000.
- Heywood, V.H., Brummitt, R.K., Culham, A., and Seberg, O. 2007. *Flowering plant families of the world*. Firefly Books, New York. pp 381
- Hickey, L.J., and Peterson, R.K. 1978. *Zingiberopsis*, a fossil genus of the ginger family from the Late Cretaceous to early Eocene sediments of Western Interior North America. *Can. J. Bot.*, 56: 1136-1152.
- Hill, R. 1980. A stopping rule for partitioning dendrograms. *Bot. Gaz.* 141(3): 321-324.
- Horne, E.C., Kumpatla, S.P., Patterson, M.G., and Thompson, S.A. 2004. Improved high-throughput sunflower and cotton genomic DNA extraction and PCR fidelity. *Plant Mol. Biol. Rep.*, 22: 83.
- Horner, H.T. 2012. *Peperomia* leaf cell wall interface between the multiple hypodermis and crystal-containing photosynthetic layer displays unusual pit fields. *Annals. of Botany*, 109: 1307-1315.
- Hosszu, G. 2021. *Scriptinformatics: Extended phenetic approach to script evolution*. Nap Kiado Kft. ("Sun" Publishing), Budapest, Hungary. pp. 22.

- Hutchings, M.J. dan H. de Kroon. 1994. Foraging in plants: the role of morphological plasticity in resource acquisition. *Advances in Ecological Research*, 25: 160-211.
- Inoue, S., Kinoshita, T., and Shimazaki, K. 2005. Possible involvement of phototropins in leaf movement of kidney bean in response to blue light. *Plant Physiology*, 138: 1994-2004.
- Jamilah, C., Waluyo, B., and Kurniawan, A. 2011. Parameter genetik akses tanaman kerabat liar ubi jalar koleksi Universitas Padjajaran untuk peningkatan genetik dan sumber perbaikan karakter ubi jalar. *Makalah*. In *Seminar Nasional Pemuliaan Berbasis Potensi dan Kearifan Lokal Menghadapi Tantangan Globalisasi. Kerjasama Peripi Komda Banyumas dan Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Jenderal Soedirman, Purwokerto*, 8-9 Juli.
- Jarvis, D.I., Brown, A.H.D., Cuong, P.H., Panduro, L.C., Moreno, L.L., Gyawali, S., Tanto, T., Sawadogo, M., Mar, I., Sadiki, M., Hue, N.T.N., Reyes, L.A., Balma, D., Bajracharya, J., Castillo, F., Rijal, D., Belqadi, L., Rana, R., Saidi, J. Ouedraogo, R. Zangre, K. Rhrub, J.L. Chavez, D. Schoen, B. Sthapit, S., De Santis, P., Fadda, C., and Hodgkin, T. 2008. A global perspective of the richness and evenness of traditional crop-variety diversity maintained by farming communities. *Proc. Natl. Acad. Sci. U.S.A.*, 105: 5326–5331.
- Jayaprabha, J.S., Brahmakumar, M., and Manilal, V.B. 2011. Banana batang semu characterization and its fiber property evaluation on physical and bioextraction. *Journal of Natural Fibers*, 8: 149-160.
- Jiang, W.H., Liu, T.X., Nan, W.Z., Jeewani, C., Niu, Y.L., Li, C.L., Wang, Y., Shi, X., Wang, C., Wang, J.H., Li, Y., Gao, X., and Wang, Z.H. 2018. Two transcription factors TaPpml and TaPpb1 co-regulate the anthocyanin biosynthesis in purple pericarp of wheat. *J. Exp. Bot.*, 69: 2555–2567.
- Joarder, N., Roy, A.K., Sima, S.N., and Parvin, K. 2010. Leaf blade and midrib anatomy of two sugarcane cultivars of Bangladesh. *J. Bio-Sci.*, 18: 66-73.
- Johansen, D.A. 1940. *Plant Microtechnique*. McGraw Hill Book Company. New York. p. 523
- Joshi, S.P., Gupta, Y.S., Aggarwal, R.K., Ranjekar, P.K., and Brar, D.S. 2000. Genetic diversity and phylogenetic relationship as revealed by inter-simple sequence repeat (ISSR) polymorphism in the genus *Oryza*. *Theor. Appl. Genet.*, 100: 1311-1320.
- Jyothi, A.N., Sheriff, J.T., and Sajeev, M.S. 2009. Physical and functional properties of arrowroot starch extrudates. *J. Food Sci.*, 74: 97–104.
- Kalve, S., Vos, D.D., Beemster, G.T.S. 2015. Leaf development: a cellular perspective. *Front. Plant Sci.*, ([doi: 10.3389/fpls.2014.00362](https://doi.org/10.3389/fpls.2014.00362))
- Kambale, S.R., and Anil, B. 2018. Molecular characterization of cashew (*Anacardium occidentale* L.) varieties grown in Maharashtra using ISSR markers. *International Journal of Agricultural Sciences*, 10(16): 7025-7028.
- Karabourniotis, G., Kotsabassidis, D., and Manetas, Y. 1995. Trichome density and its protective potential against ultraviolet-B radiation damage during leaf development. *Can. J. Bot.*, 73: 376–383.

- Karabourniotis, G., Liakopoulos, G., Nikolopoulos, D., and Bresta, P. 2020. Protective and defensive roles of non-glandular trichomes against multiple stresses: structure-function coordination. *J. For. Res.*, 31: 1-12.
- Kay, D.E. 1973. *Crop and Peoduct Digest no. 2-Root Crops 2nd Edition*. Tropical Development and Research Institute, London. p. 308.
- Kennedy, H.. 1997. New species of Calathea (Marantaceae) endemic to Costa Rica. *Canadian Journal of Botany*, 75(8): 1356-1362.
- \_\_\_\_\_. 2000. *Diversification in pollination mechanisms in the Marantaceae*. pp 335-343. In Wilson, K.L., and Morrison, D.A. (Eds.) *Monocots: systematics and evolution*. CSIRO, Melbourne.
- Kim, G-T, Yano, S., Kozuka, T., and Tsukaya, H. 2005. Photomorphogenesis of leaves: shade-avoidance and differentiation of sun and shade leaves. *Photochem. Photobiol. Sci.*, 4: 770-774.
- Kitahara, K., Hamasuna, K., Nozuma, K., Otani, M., Hamada, T., Shimada, T., Fujita, K., and Sukanuma, T. 2007. Physicochemical properties of amylose-free and high-amylose starches from transgenic sweet potatoes modified by RNA interference. *Carbohydr. Polym.*, 69: 233-240.
- Konarska, A. 2015. Characteristics of fruit (*Prunus domestica* L.) skin: structure and antioxidant content. *International Journal of Food Properties*, 18(11): 2487-2499.
- Koul, M., and Bhatnagar, A.K. 2017. Changes in the leaf epidermal features of *Cyamopsis tetragonoloba* (L.) Taub. in response to lead in soil. *Phytomorphology*, 67: 1-10.
- Kubínová, L. 1991. Stomata and mesophyll characteristics of barley leaf as affected by light: Stereological analysis. *J. Exp. Botany*, 42(241): 995-1001.
- Kumar, N., Arpan, R.M., Amritpai, S.S., Bhavesh, B.G., and Armi, R.P. 2010. Assessment of genetic fidelity of micropropagated date palm (*Phoenix dactylifera* L.) plants by RAPD and ISSR markers assay. *Physiol. Mol. Biol. Plants*, 16(2): 207-2014.
- Kubin, P., Melzer, A., and Cizkova, H. 1994. The relationship between starch content in rhizomes of *Phragmites australis* (Cav.) Trin. Ex Steud. And thropic conditions of habitat. *Proceedings of the Royal Society of Edinburgh*, 102B: 433-438.
- Kuznia, E., Kornas, A., Kazmierczak, A., Rozpadek, P., Nosek, M., Kocurek, M., Zellnig, G., Muller, M., and Miszalsk, Z. 2016. Photosynthesis-related characteristics of the midrib and the interveinal lamina in leaves of the C3-CAM intermediate plant *Mesembryanthemum crustallinum*. *Annals of Botany*, 117: 1141-1151.
- Lack, A.J. and Evans, D.E. 2001. *Instant Notes of Plant Biology*. BIOS Scientific Publishers Limited, Oxford.
- Larkin, J.C., Young, N., Prigge, M., Marks, M.D. 1996. The control of trichome spacing and number in *Arabidopsis*. *Development*, 122: 997-1005.
- Legris, M., Ince, Y.Ç. and Fankhauser, C. 2019. Molecular mechanisms underlying phytochrome-controlled morphogenesis in plants. *Nat Commun* **10**, 5219 ([doi: 10.1038/s41467-019-13045-0](https://doi.org/10.1038/s41467-019-13045-0)).
- Lestari, E.G. 2005. Hubungan antara kerapatan stomata dengan ketahanan kekeringan pada somaklonan padi Gajahmungkur, Towuti, dan IR64 [Relationship between stomata density and drought resistance in

- Gajahmungkur, Towuti, and IR64 rice somaklonan]. *BIODIVERSITAS*, 7(1): 44-48.
- Lestari, L.A., Huriyati, E., and Marsono, Y. 2017. The development of low glycemic index cookie bars from foxtail millet (*Setaria italica*), arrowroot (*Maranta arundinacea*) flour, and kidney beans (*Phaseolus vulgaris*). *Journal of Food Science and Technology*, 54: 1406-1413.
- Leonel, M. and Cereda, M.P. 2002. Caracterização físico-química de algumas tuberosas amiláceas [Physicochemical characterization of some starchy tuberoses]. *Ciência e Tecnologia de Alimentos*, 22: 65-69.
- Ley, A.C., and Claßen-Bockhoff, R. 2009. Pollination syndromes in African Marantaceae. *Annals of Botany*, 104: 41-56.
- Li, J.T., Yang, J., Chen, D.C., Zhang, X.L., and Tang, Z.S. 2007. An optimized mini-preparation method to obtain high-quality genomic DNA from mature leaves of sunflower. *Genet Mol. Res.*, 6:1064.
- Li, Q., Deng, M., Xiong, Y., Coombes, A., and Zhao, W. 2014. Morphological and photosynthetic response to high and low irradiance of *Aeschynanthus longicaulis*. *Scientific World Journal*, Volume 2014, Article ID 347461, 8 pages (doi: 10.1155/2014/347461).
- Lim, T.K. 2016. *Edible Medicinal and Non-Medicinal Plants: Volume 11, Modified Stems, Roots, Bulbs*. Springer International Publishing, Switzerland. pp 47-54.
- Liu, X., and Liu, C. 2016. Effects of drought-stress on *Fusarium* crown rot development in barley. *PLOS ONE*, 11:e0167304.
- Liu, H., Specht, C.D., Zhao, T., and Liao, J. 2020. Morphological anatomy of leaf and rhizome in *Zingiber officinale* Roscoe. with emphasis on secretory structures. *HortScience*, 55(2): 204-207.
- Locatelli, E., Machado, I.C., and Medeiros, P. 2004. *Saranthe klotzschiana* (Koer.) Eichl. (Marantaceae) e seu mecanismo explosivo de polinizacao [*Saranthe klotzschean* (Koer.) Eichl. (Marantaceae) and its explosive pollination mechanism]. *Revista Brasileira de botanica*, 27: 757-765.
- Ma, X., and Huang, B. 2016. Gibberellin-Stimulation of Rhizome Elongation and Differential GA-Responsive Proteomic Changes in Two Grass Species. *Front. Plant Sci.* 7: 905.
- Macedo, A.F., Leal-Costa, M.V., Tavares, E.S., Lage, C.L.S., and Esquibel, M.A. 2011. The effect of light quality on leaf production and development of in vitro-cultured plants of *Alternanthera brasiliana* Kuntze. *Environmental and Experimental Botany*, 70: 43-50.
- Madeira, N.R., Silva, P.C., Botrel, N., Mendonça, J.L., Silveira, G.S.R., and Pedrosa, M.W. 2013. *Manual de produção de hortaliças tradicionais*. Embrapa, Brasília, p. 100.
- Madineni, M.N., Faiza, S., Surekha, R.S., Ravi, R., and Guha, M. 2012. Morphological, structural, and functional properties of *Maranta* (*Maranta arundinacea* L.) starch. *Food Science Biotechnology*, 21(3): 747-752.
- Malinis, A.P., and Pacardo, C.O. 2012. Adaptation of arrowroot (*Maranta arundinacea* L.) processing technologies in Typhoon prone marginal areas in Bicol. *Ontario International Development Agency*, 4(3): 51-62.
- Masitoh, S. 2014. Densitas spesies garut (*Maranta arundinacea*) di Daerah Istimewa Yogyakarta [The density of arrowroot (*Maranta arundinacea*)

- species in the Special Region of Yogyakarta]. *Thesis*. Universitas Islam Negeri Sunan Kalijaga. Yogyakarta, Indonesia.
- Mason, W., 2009. *Starch use in foods*. pp 1-879. In Whistler, R.L., BeMiller, J.N., Paschall, E.F. (Eds.) *Starch: Chemistry and Technology, 3<sup>rd</sup> ed.* Academic Press, New York.
- McIntyre, G.I. 1965. Some effects of nitrogen supply on the growth and development of *Agropyron repens* L. Beauv. *Weed Res.* 5: 1-12.
- \_\_\_\_\_. 1967. Environmental control of bud and rhizome development in the seedling of *Agropyron repens* L. Beauv. *Can. J. Bot.* 45: 1315-1326.
- \_\_\_\_\_. 1976. Apical dominance in the rhizome of *Agropyron repens*: the influence of water stress on bud activity. *Can. J. Bot.* 54: 2747-2754.
- Metusala, D., J. Supriatna, Nisyawati, D. Sopandie. 2017. Comparative leaf and root anatomy of two *Dendrobium* species (Orchidaceae) from different habitat in relation to their potential adaptation to drought. *AIP Conference Proceedings*, 1862, 03/01/18 (2017).
- Michiels, A., den Ende, W.V., Tucker, M., and Van Riet, L. 2003. Extraction of high-quality genomic DNA from latex-containing plants. *Anal. Biochem.*, 315:85.
- Mommaerts, K., Sanchez, I., Betsou, F., and Mathieson, W. 2015. Replacing b-mercaptoethanol in RNA extractions. *Anal. Biochem.* 479: 51-53.
- Monteiro, D.A., and Peressin, V.A. 2002. *Cultura da araruta* [Arrowroot Cultivation]. pp. 440-447. In Cereda, M.P. (Eds.) *Agricultura: Tuberosas Amiláceas Latino Americanas, vol. 2* [Agriculture: Latin American Amylaceous Tuberoses, vol. 2]. Fundação Cargill, São Paulo.
- Moreno, S., Martin, J.P., and Ortiz, J.M. 1998. Inter-simple sequence repeats PCR for characterization of closely related grapevine germplasm. *Euphytica*, 101: 117-125.
- Moreira, P.A., and Oliveira, D.A. 2011. Leaf age affects the quality of DNA extracted from *Dimorphandra mollis* (Fabaceae), atropical tree species from the Cerrado region of Brazil. *Genet. Mol. Res.*, 10: 353.
- Moulin, M.M., Rodrigues, R., Gonçalves, L.S.A., Sudré, C.P., and Pereira, M.G. 2012. A comparison of RAPD and ISSR markers reveals genetic diversity among sweet potato landraces (*Ipomoea batatas* (L.) Lam.). *Acta Scientiarum. Agronomy*, 34(2): 139-147.
- Mukhopadhyay, S., and A.K. Sharma. 1984. Feulgen microspectrophotometric estimation of nuclear DNA of species and varieties of three different genera of Marantaceae. *Proc. Indian Acad. Sci. (Plant Sci.)*, 93(3): 337-347. India.
- \_\_\_\_\_. 1987. Karyomorphological analysis of different species and varieties of *Calathea*, *Maranta*, and *Stromanthe* of Marantaceae. *Cytologia*, 52: 821-831.
- Nakamura, A.T., Simao, E., Silva, L., Torres, G.A. 2015. Origin of the subepidermal tissue in *Piper* L. leaves. *Braz. J. Bio.*, 75(2): 368-371.
- Nakano, T. 2001. Study on gel actuators learned from action plants. *Thesis*. Dept. of Mech. Eng., Gifu University, Japan.
- Ng, W.L., and Tan, S.G. 2015. Inter-Simple Sequence Repeat (ISSR) Markers: Are We Doing It Right? . *ASM Sci. J.* 9(1): 30-39.
- Nishizaki, Y. 1996. Effects of blue light on electrical potential and turgor in pulvinar motor cells of *Phaseolus*. *J. Plant Res.*, 109: 93-97.

- Ntefdou, M., and Manetas, Y. 1996. Optical properties of hairs during the early stages of leaf development in *Platanus orientalis*. *Aust. J. Plant Physiol.*, 23: 535–538
- Nurhayati, H., Sudiarto, Gusmaini, and Rahardjo, M. 2003. Daya hasil umbi-umbian dan pati beberapa aksesori garut (*Marantha arundinacea* L.) pada beberapa tingkat naungan [Yield of tubers and starch of several accessions of arrowroot (*Marantha arundinacea* L.) at various levels of shade]. *Jurnal Ilmiah Pertanian*, IX(2): 17–25.
- Nurkhasanah, N., Wicaksono, K.P. and Widaryanto, E. 2013. Studi pemberian airdan tingkat naungan terhadap pertumbuhan bibit tanaman cabe jamu (*Piper retrofractum* Vahl.) [Study of providing water and shading on the growth of herbal chili plant seeds (*Piper retrofractum* Vahl.)]. *J. Prod. Tan.*, 1:325-332.
- Oktafani, M.B., Supriyono, M.T., Budiastuti, S., and Purnomo, D. 2018. Performance of arrowroot (*Maranta arundinacea* L.) in various light intensities. *IOP Conf. Series: Earth and Environmental Science*, 142.
- Patola, L.N.P., Supriyono, and Pardjanto. 2017. Effect use biofertilizer and differences type soil on growth and yield arrowroot. *Sains Tanah – Journal of Soil Science and Agroclimatology*, 14(1): 26-32.
- Paiva, E.A.S., Isaias, R.M.D., Vale, F.H.A., and Queiroz, C.G.D. 2003. The influence of light intensity on anatomical structure and pigment contents of *Tradescantia pallida* (Rose) Hunt. cv. *purpurea* Boom (Commelinaceae) leaves. *Brazilian Archives of Biology and Technology Journal*, 4: 617-625.
- Petersen, O.G. 1889. *Marantaceae*. 2: 31–34. In Engler A., Prantl K., (Eds.). *Die natürliche Pflanzenfamilien* [The natural plant families].
- Perez, M., Teixeira da Silva, J.A., and Lao, M.T. 2006. *Light management in ornamental crop. Floriculture, Ornamental and Plant Biotechnology Vol. IV*. Global Science Books, UK, pp 684-690.
- Perez-de-Castro, A.M., Vilanova, S., Cañizares, J., Pascual, L., Blanca, J.M., Diez, M.J., Prohens, J., and Picó, B. 2012. Application of genomic tools in plant breeding. *Current Genomics*. 13;179-195.
- Perper, I. 2019. How light intensity affects cyclic plant movement. *Scientific Article*. Massachusetts Institute of Technology, USA.
- Phong, D.T., Hien, V.T.T., Thanh, T.T.V., and Tang, D.V. 2011. Comparison of RAPD and ISSR markers for assessment of genetic diversity among endangered rare *Dalbergia oliveri* (Fabaceae) genotypes in Vietnam. *Genet. Mol. Res.*, 10(4): 2382-2393.
- Pinto, I.B. 2015. *Caracterização dos genes matK e rbcL e da variabilidade genética entre os acessos de Araruta (Maranta arundinacea L.)* [Characterization of matK and rbcL genes and genetic variability among Araruta (*Maranta arundinacea* L.) accessions]. Universidade Católica Dom Bosco, Campo Grande. p. 60.
- Puccio, P. 2019. *Maranta arundinacea L. Family: Marantaceae*. (<https://www.monaconatureencyclopedia.com/maranta> ). Diakses pada 7 Maret 2019.
- Prajapati, N.D., Purohit, S.S., Sharma, A.K., and Kumar, T. 2003. *A Hand Book of Medicinal Plants*. Agrobios India, Jodhpur. pp 30-34.

- Pridgeon, A.M. 1982. Diagnostic anatomical characters in the Pleurothallidinae (Orchidaceae). *Amer. J. Bot.*, 69(6): 921-938.
- Purnomo. 2013. Biosistematika Tanaman Uwi (*Dioscorea alata* L.) dan Spesies Kerabat Dekatnya di Indonesia Berdasarkan Penanda Morfologis, Anatomis, dan Molekuler [Biosystematics of Uwi Plant (*Dioscorea alata* L.) and its Close Relative Species in Indonesia Based on Morphological, Anatomical, and Molecular Markers]. *Dissertation* (unpublished). Fakultas Biologi UGM, Yogyakarta, Indonesia.
- Pusat Penelitian Tanah dan Agroklimat. 1994. *Pemetaan sumber daya lahan untuk pengembangan pertanian lahan kering dan konservasi tanah dan air di Provinsi DIY: Laporan Survei Pemetaan Sumber Daya Lahan, Konservasi Tanah dan Air* [Mapping of land resources for the development of dry land agriculture and soil and water conservation in DIY Province: Land Resource Mapping Survey Report, Soil and Water Conservation]. Pusat Penelitian Tanah dan Agroklimat, Bogor.
- Puspitasari, L., Triadiati, and Sulistijorini. 2019. Physiological response and photosynthate distribution of west-indian arrowroot at different altitudes. *AGRIVITA: Journal of Agricultural Science*, 41(1): 117-128.
- Prevost, A., and Wilkinson, M.J. 1999. A new system of comparing PCR primers applied to ISSR fingerprinting of potato cultivars. *Theor. Appl. Genet.* 98: 107-112.
- Prentice, H. 1986. *Formal and informal classification of the infraspecific variability cultivated plants - advantages and limitations*. pp. 139-156. In Styles, B.T. (Eds.). *Infraspecific Classification of Wild and Cultivated Plants*. Oxford University Press, New York.
- Qodliyati, M., Supriyono, and Nyoto, S. 2018. Influence of spacing and depth of planting to growth and yield of arrowroot (*Maranta arundinacea* L.). *IOP Conf. Series: Earth and Environmental Science*, 142.
- Quach, V., Sauer, R., Smith, H., Wright, C. 2014. Comparison of photosynthetic ability in single and double palisade parenchyma leaves in southern California. *Featured Research*, Pepperdine University, Paper 111.
- Raja, M.K.C., and Sindhu, P. 2000. Properties of steam-treated arrowroot (*Maranta arundinacea* L.) starch. *Starch*, 52: 471-476.
- Rahayu, S.E., and Handayani, S. 2010. Keragaman genetik pandan asal Jawa Barat berdasarkan penanda *Inter Simple Sequence Repeat* [The genetic diversity of pandanus from West Java based on the Inter Simple Sequence Repeat marker]. *Jurnal MAKARA, Sains*, 14(2): 158-162.
- Ratkowsky, D.A., and Lance, G.N. 1978. A criterion for determining the number of groups in a classification. *Australian Computer J.* 10: 115-117.
- Reddy, P.M., Sarla, N., and Siddiq, E.A. 2002. Inter simple sequence repeat (ISSR) polymorphism and its application in plant breeding. *Euphytica* 128: 9-7.
- Renner, S.S. 2016. A return to Linnaeu's focus on diagnosis, not descriptive: the use of DNA characters in the formal naming of species. *Syst. Bio.*, 65(6): 1085-1095.
- Rini, P.E., Hasanah, M., and Sudiarto. 2002. Kelayakan usahatani dan pengolahan garut di Jawa timur [The feasibility of farming and processing arrowroot in East Java]. *Buletin Tanaman Rempah dan Obat*, XIII(1).

- Rohandi, A., Budiadi, Hardiwinoto, S., Harmayani, E., and Sudrajat, D.J. 2017. Variability in morphophysiology, tuber yield and starch content of several arrowroot populations in Garut district. *AGRIVITA Journal of Agricultural Science*, 39(3): 311–323.
- Rojas-Sandoval, J. 2018. *Maranta arundinacea* (arrowroot). *Invasive Species Compendium*. Wallingford, UK: CABI. (10.1079/ISC.32455.20203483388)
- Roy, S.C., and Shil, P. 2020. Assessment of genetic heritability in rice breeding lines based on morphological traits and caryopsis ultrastructure. *Sci Rep* **10**, 7830. (10.1038/s41598-020-63976-8).
- Rubatzky, V.E., and Yamaguchi, M. 1997. *World Vegetables: Principles, Production, and Nutritive Values*. Springer-Science and Business Media, B.V. Dordrecht. p. 208-209.
- Sahu, S.K., Thangaraj, M., and Kathiresan, K.D.N.A. 2012. Extraction protocol for plants with high levels of secondary metabolites and polysaccharides without using liquid nitrogen and phenol. *Mol. Biol.*, 12:1.
- Rukmana, R. 2000. *Garut, Budidaya dan Pasca Panen* [Arrowroot, Cultivation and Post Harvest]. Kanisius. Yogyakarta. pp 43-47.
- Sambrook, J., and Russell, D.W. 2001. *Molecular Cloning. A Laboratory Manual*. Cold Spring Harbor Laboratory Press, New York.
- Sastra, D.R. 2003. Analisis keragaman genetik *Maranta arundinacea* L. berdasarkan penanda molekuler RAPD [Analysis of genetic diversity of *Maranta arundinacea* L. based on the molecular marker RAPD]. *J. Sains dan Teknologi Indonesia*, 5(5): 209-218.
- Sawadogo, M., Ouedraogo, J.T., Zangre, R.G., and Balma, D. 2005. *Diversite biologique agricole et les facteuure de don maintien en milieu paysan* [Agricultural biological diversity and the factors of maintenance donation in the peasant environment]. In Balma, E.D., Sawadogo, M., Zangre, R.G., Ouedraogo, J.T., and Jarvis, D.I. (Eds.) *Lagestion de la diversite des plantes agricoles dans les agro-ecosystemes. Compte-rendu des travaux d'un atelier abrite par CNRST*, Burkina Faso, 27–28 December. International Plant Genetic Resources Institute, Rome.
- Setyowati N. 2013. Tanaman garut (*Maranta arundinacea* L.) lokal DI Yogyakarta [Local Plant of Arrowroot (*Maranta arundinacea* L.) in DI Yogyakarta] [Thesis]. Universitas Islam Negeri Sunan Kalijaga Yogyakarta.
- Schippmann, U., Leaman, D.J., Cunningham, A.B.A., and Walter, S. 2005. Impact of cultivation and collection on the conservation of medicinal plants: Global trends and issues. *Acta Horticulturae*, 676: 31-44.
- Shafiei-Astani B, Ong AHK, Valdiani A, Tan SG, Yong CSY, Ahmady F, Alitheen NB, Ng WL, Kaur T. 2015. Molecular genetic variation and structure of Southeast Asian crocodile (*Tomistoma schlegelii*): comparative potentials of SSRs versus ISSRs. *Gene*, 571: 107–116.
- Sheeja, T.E., Uma, G., Sasikumar, B., Saji, K.V., and Rahul, P.R. 2013. Genetic diversity study in *Piper* spp. using inter simple sequence repeat (ISSR) markers. *J. Spice and Aromatic Crops*, 22(2): 111-119.
- Shen J, Ding X, Liu D, Deng G, He J, Li X, Tang F, Chu B. 2006. Intersimple sequence repeats (ISSR) molecular fingerprinting markers for authenticating populations of *Dendrobium officinale* Kimura et Migo. *Biological and Pharmaceutical Bulletin* 29:420–422.

- Shintu, P.V., Radhakrishnan, V.V., and Mohanan, K.V. 2017. Factor analysis in *Maranta arundinacea* L. *International Journal of Current Advanced Research*, 6(11): 7328-7331.
- Singh, G. 2019. *Plant Systematics: An integrated approach*, 4<sup>th</sup> eds. CRC Press, p 300.
- Singh, K. 2019. *Different Types of Nastic Movements*. (<https://www.preservearticles.com/botany...>). diakses pada tanggal 28 Februari 2019.
- Silveira, J.R.S., Santos, C.M.F.T., Silva, J.B., Batista, A.J., and Costa, J.A. 2013. Resgate da cultura da araruta junto aos agricultores familiares no Território do Recôncavo da Bahia [Arrowroot crop rescue from family farmers in the Reconcavo da Bahia Territory]. *Cadernos de Agroecologia*, 8 (1): 1-5.
- Simao, D.G., and Scatena, V.L. 2001. Morphology and anatomy in *Heliconia angusta* Vell. And *H. velloziana* L. Emygd. (Zingiberales: Heliconiaceae) from the Atlantic forest of southeastern Brazil. *Revta Brasil. Bot.*, 24(4): 415-424.
- Skutch, A.F. 1930. Unrolling of leaves of *Musa sapientium* and some related plants and their reactions to environmental aridity. *Bot. Gaz.*, 90: 337-365.
- Smith, J.P.Jr. 2017. Dichotomous keys – their structure and use. *Botanical Studies*, 58 ([https://digitalcommons.humboldt.edu/botany\\_jps](https://digitalcommons.humboldt.edu/botany_jps)).
- Sneath, P.H.A. dan R.R. Sokal, 1973. *Numerical taxonomy: The principles and practice of numerical classification*. W.H. Freeman & Co., New York. p 110.
- Soenarsih, S., Sudarsono, Djoefrie, H.M.H.B., dan Y. Wahyu E.K. 2012. Keragaman spesies pala (*Myristica* spp.) Maluku Utara berdasarkan penanda morfologi dan agronomi [Species diversity of nutmeg (*Myristica* spp.) North Maluku based on morphological and agronomic markers]. *Jurnal Littri* 18(1): 1-9.
- Soleri, D., and Cleveland, D.A. 2001. Farmers' genetic perceptions regarding their crop populations: an example with maize in central valleys of Oaxaca, Mexico. *Economic botany*, 55(1):106–128..
- Spooner, D.M., van den Berg, R., Hetterscheid, W.L.A., Brandenburg, W.A. 2005. Plant Nomenclature and Taxonomy: An Horticultural and Agronomic Perspective. *Horticultural Reviews*, 28: 20-32.
- Sreelakshmi, V.V., Sruthy, E.P.M., and Shereena, J. 2014. Relationship between the leaf area and taxonomic importance of foliar stomata. *International Journal of Research in Applied, Natural, and Social Sciences*, 2(7): 53-60.
- Stace, C.A. 1984. *The taxonomic importance of the leaf surface*. pp 67–94. In Heywood, V.H., and Moore, D.M. (Eds.) *Current concepts in plant taxonomy*, vol 25. Academic, London.
- Stern, W.L. and Carlsward, B.S. 2008. Vegetative anatomy of Calypsoeae (Orchidaceae). *Lankesteriana*, 8(1): 105-112.
- Stevens, W.D., Ulloa, C.U., Pool, A., and Montiel, O.M. 2001. *Flora de Nicaragua*. Missouri Botanical Garden Press ([www.tropicos.org](http://www.tropicos.org)). Diakses pada 8 Agustus 2019.
- Strauss-deBenedetti, S. and Berlyn, G. P. 1994. Leaf anatomical responses to light in life tropical Moraceae of different successional status. *Am. J. Botany*, 81:(12), 1582-1591.

- Stuessy, T.F. 2009. *Plant Taxonomy: The Systematic Evolution of Comparative Data. 2<sup>nd</sup> Edition*. Columbia University Press, New York.
- Styles, B.T. 1986. *Infraspecific Classification of Wild and Cultivated Plants*. Oxford Forestry Institute, Department of Plant Science, University of Oxford. Oxford. p. 77.
- Sudiarto and Rosita. 1998. *Budidaya dan Pengolahan Pati Garut* [Arrowroot Cultivation and Starch Processing]. Balai Penelitian Tanaman Rempah dan Obat. Bogor. pp 2.
- Suh, S., Moran, N., and Lee, Y. 2000. Blue light activates potassium-efflux channels in flexor cells from *Samanea saman* motor organs via two mechanisms. *Plant Physiol*, 123: 833–843
- Suhartini, T., and Hadiatmi. 2011. Keragaman karakter morfologis garut (*Maranta arundinacea* L.) [Diversity of arrowroot morphological characters (*Maranta arundinacea* L.)]. *Buletin Plasma Nutfah*, 17(1): 12-19.
- Suhendrata, T. 2013. Prospek dan kendala dalam pengembangan agribisnis tanaman garut (*Maranta arundinacea* L.) di Kabupaten Sragen [Prospects and constraints in the development of arrowroot (*Maranta arundinacea* L.) agribusiness in Sragen Regency]. *Seminar Nasional: Menggagas Kebangkitan Komoditas Unggulan Lokal Pertanian dan Kelautan*. Fakultas Pertanian, Universitas Trunojoyo Madura.
- Sulborska, A., Konarska, A., Matysik-Wozniak, A., Dmitruk, M., Weryszko-Chmielewska, E., Skalska-Kaminska, A., Rejdak, R., 2020. Phenolic constituents of *Lamium album* L. subsp. *Album* flowers: anatomical, histochemical, and phytochemical study. *Molecules*, 25(24): 6025. (doi: 10.3390/molecules25246025).
- Sumardi, I. and Wulandari, M. 2010. Anatomy and morphology character of five Indonesian banana cultivars (*Musa* spp.) of different ploidy level. *BIODIVERSITAS*, 11(4): 167-175.
- Suman, P.S.K., Ajit, K.S., Darokar, M.P., and Sushil, K. 1999. Rapid isolation of DNA from dry and fresh samples of plants producing large amounts of secondary metabolites and essential oils. *Plant Mol Biol Rep*. 17:1.
- Suranto. 1991. Studies of population variation in species of *Ranunculus*. *Thesis*. Department of Plant Science, University of Tasmania. Hobart, Tasmania.
- Suriawiria, U. 2007. *Tepung Garut, Alternatif Pengganti Tepung Terigu*. ([www.utkampus.net](http://www.utkampus.net)) Diakses tanggal 3 Februari 2019.
- Susandarini, R. 2014. *Biosistematika Pamelon (*Citrus maxima* (Burm.) Merr.) di Indonesia Berdasarkan Kajian Morfologis, Fitokimia, dan Molekuler* [Biosystematics of Pamelon (*Citrus maxima* (Burm.) Merr.) in Indonesia Based on Morphological, Phytochemical, and Molecular Studies]. *Dissertation*. Fakultas Biologi, Universitas Gadjah Mada, Yogyakarta.
- Swadija, O.K., Padmanabhan, V.B., and Vijayaraghavakumar. 2013. Growth and yield of arrowroot intercropped in coconut garden as influence by organic management. *J. Rootcrops*, 30: 67-72.
- Tachiki, Y., Makita, A., Suyama, Y., and Satake, A. 2015. A spatially explicit model for flowering time in bamboos long rhizomes drive the evolution of delayed flowering. *Journal of Ecology*, 103: 585-593.
- Taiz, L., Eduardo, Z., Ian, M.M., and Angus, M. 2015. *Plant Physiology and Development 6<sup>th</sup> ed.* (Sinauer)s. pp 37-41.

- Tan, S.C., and Yiap, B.C. 2009. DNA, RNA, and protein extraction: the past and the present. *Journal of Biomedicine and Biotechnology* Volume 2009, Article ID 574398, 10 pages (doi: 10.1155/2009/574398).
- Tan, S.L., and Zaharah, A. 2015. Tuber crop are under ground crops: the most important ones in Malaysia are the white potato, the sweetpotato, cassava, and cocoyam. *Utar Agriculture Science J.*, 1(1): 41-48.
- Tang, L., Cheng, C., Wan, K., Li, R., Wang, D., and Tao, Y. 2014. Impact of fertilizing pattern on the biodiversity of a weed community and wheat growth. *PLoS ONE*, 9(1): e84370.
- Tanto, T. 2001. Unpublished data presented at an international workshop “Strengthening the Scientific Bases of *In-Situ* Conservation of Agricultural Biodiversity: Genetic Diversity and On-Farm Conservation Workshop, 11–19 June 2001, Ouagadougou, Burkina Faso.
- Tautz, D., and Renz, M. 1984. Simple sequences are ubiquitous repetitive components of eukaryotic genomes. *Nucleic Acids Res.*, 12(10): 4127-4138.
- Tesfaye, B., and Ludders, P. 2003. Diversity and distribution patterns of enset landraces in Sidama, southern Ethiopia. *Genetic Resources and Crop Revolution* 50:359–371.
- Teshome, A., Baum, B.R., Fahrig, L., Torrance, J.K., Arnason, T.J., Lambert, J.D. 1997. Sorghum (*Sorghum bicolor* L. Moench) landrace variation and classification in North Shewa and South Welo, Ethiopia. *Euphytica*, 97:255–263.
- Thamburaj, S., and Singh, N. 2001. *The Text Book of Vegetables, Tuber Crops and Spices*. Indian Council of Agricultural Research, New Delhi, India. p 470.
- The Plant List. n.d. *Maranta arundinacea* L. (<http://www.theplantlist.org/tpl1.1/record/kew-253261>) Diakses pada 8 Agustus 2019.
- The Survival Gardener. 2016. *Growing Arrowroot* (<https://www.thesurvivalgardener.com/growing-arrowroot/>) Diakses pada 8 Agustus 2019.
- Tomlinson, P.B. 1959. An anatomical approach to the classification of the Musaceae. *Bot. J. Linn. Soc.*, 55: 779-809.
- \_\_\_\_\_. 1961. Morphological and anatomical characteristics of the Marantaceae. *J. Linn. Soc. (Bot.)*, 58(370): 55-79.
- \_\_\_\_\_. 1969. *Commelinales-Zingiberales*. pp. 295-324. In Metcalfe, C.R., (Eds.) *Anatomy of the monocotyledons III*. Clarendon Press, Oxford.
- Tripathi, S., Hoang, Q.T.N., Han, Y-J., and Kim, J-I. 2019. Regulation of photomorphogenic development by plant phytochromes. *Int. J. Mol. Sci.*, 20:61-65.
- Triplet, J.K., and Kirchoff, B.K. 1991. Lamina architecture and anatomy in the Heliconiaceae and Musaceae (Zingiberales). *Canadian Journal of Botany*, 69: 887-900.
- Tsumura, Y., Ohba, K., and Strauss, S.H. 1999. Diversity and inheritance of inter-simple sequence repeat polymorphisms in Douglasfir (*Pseudotsuga menziesii*) and sugi (*Cryptomeria japonica*). *Theor. Appl. Genet.*, 92: 40-45.
- Václaník, T., Beckmann, M., Cord, A.F., and Bindewald, A.M. 2017. Effects of UV-B radiation on leaf hair traits of invasive plants—combining historical

- herbarium records with novel remote sensing data. *PLoS ONE*, 12(4):e0175671.
- Valkama, E., Salminen, J.P., Koricheva, J., and Pihlaja, K. 2004. Changes in leaf trichomes and epicuticular favonoids during leaf development in three birch taxa. *Ann. Bot.*, 94(2): 233–242.
- van Steenis, C.G.G.J. 1975. *Flora: untuk sekolah di Indonesia*. Pradnya Paramita, Jakarta. p. 167.
- Vieira, S., and Souza, V. 2008. Four new species of *Maranta* L. (Marantaceae) from Brazil. *Botanical Journal of the Linnean Society*, 158(1): 131-139.
- Vijayan K. 2005. Inter Simple Sequence Repeat (ISSR) polymorphism and its application in mulberry genome analysis. *International Journal of Industrial Entomology* 10:79-86.
- Virk, P.S., Zhu, I., Newbury, H.J., Bryan, G.J., Jackson, M.T., and Ford-Lloyd, B.Y. 2000. Effectiveness of different classes of molecular marker for classifying and revealing variation in rice (*Oryza sativa*) germplasm. *Euphytica*, 112: 275-284.
- Wang, X., Haga, K., Nishizaki, Y., and Iino, M. 2001. Blue-light-dependent osmoregulation in protoplasts of *Phaseolus vulgaris* pulvini. *Plant Physiol.*, 42: 1368–1372.
- Wang, Y.P., Liu, S., Chen, Y.Z., and Lu, C.F. 2012. Leaf structural characteristics of three wild *Rhododendron* plants and their adaptability to Changbai mountain northeastern China. *Journal of Beijing Forestry University*, 34: 18-25.
- Watanabe, S., and Sibaoka, T. 1973. Site of photo-reception to opening response in *Mimosa* leaflets. *Plant and Cell Physiology* 14:1221-1224.
- Werker, E. 2000. Trichome diversity and development. *Adv Bot Res*, 31:1–35.
- Williams, E.D. 1971. Effects of light intensity, photoperiod and nitrogen on the growth of seedlings of *Agropyron repens* (L.) Beauv. and *Agrosris gigantea* Roth. *Weed Res.* 11, 159-170.
- Winkel and Shirley, B. 2001. Flavonoid biosynthesis: A colorful model for genetics, biochemistry, cell biology, and biotechnology. *Plant Physiol* 126:485–493
- Wolfe, A.D., Xiang, Q-Y., and Kephart, S.R. 1998. Diploid hybrid speciation in *Penstemon* (Scrophulariaceae). *Proc. Natl. Acad. Sci.*, 95: 5112-5115.
- Wolff, K., Zietkiewicz, E., and Hofstra, H. 1995. Identification of *Chrysantemum* cultivars and stability of DNA fingerprint patterns. *Theoretical Applied Genetics*, 91: 439-447.
- Wu, D., and Kennedy, H. 2000. *Marantaceae*. In: Wu, Z.Y., dan Raven P.H. (Eds.) *Flora of China, Vol 24, Flagellariaceae through Marantaceae*. Science Press/Missouri Botanical Garden Press, Beijing/St. Louis. pp 27-30.
- Yan, A., Pan, J., An, L., Gan, Y., and Feng, H. 2012. The responses of trichome mutants to enhanced ultraviolet-B radiation in *Arabidopsis thaliana*. *J Photochem Photobiol B Biol* 113:29–35.
- Yeo, P. 1993. Secondary pollen presentation: form, function and evolution. *Plant Systematics and Evolution, Suppl.*, 6: 1–268.
- Yoshida, Y., Sano, R., Wada, T., Takabayashi, J., and Okada, K. 2009. Jasmonic acid control of GLABRA3 links inducible defense and trichome patterning in *Arabidopsis*. *Development*, 136:1039–1048.



- Yu, H., Cheng, L., Yin, J., Yan, S., Liu, K., Zhang, F., Xu, B., and Li, L. 2013. Structure and physicochemical properties of starches in lotus (*Nelumbo nucifera* Gaertn.) rhizome. *Food Sci Nutr*, 1: 273-283.
- Zhou, W., and Xia, N.H. 2012. Leaf epidermal features of *Lithocarpus* (Fabaceae) from China and their systematic significance. *Bot. J. Linn. Soc.*, 168(2): 216–228.
- Zhou, H., Guo, J., Li, P., Fan, T., Zang, D., Ye, J. 2013. Leaf-architectural 3D hierarchical artificial photosynthetic system of Perovskite Titanates towards CO<sub>2</sub> Photoreduction into hydrocarbon fuels. *Sci Rep* 3, 1667. (doi: 10.1038/srep01667).
- Zhu, Z.X. and Lu, Y.Q. 2016. Plant color mutants and the anthocyanin pathway. *Chin Bull Bot* 51:107–119.
- Zietkiewicz E, Rafalski A and Labuda D. 1994. Genome fingerprinting by simple sequence repeat (SSR)-anchored polymerase chain reaction amplification. *Genomics* 20: 176-183.