

## DAFTAR PUSTAKA

- Abe, H., Murata, Y., Kubo, S., Watanabe, K., Tanaka, R., Sulaiman, O., Hashim, R., Ramle, S. F. M., Zhang, C., Noshiro, S., and Mori, Y. (2013). "Estimation of the ratio of *vascular* bundles to parenchyma tissue in oil palm trunks using NIR spectroscopy," *BioResources* 8(2), 1573-1581.
- Acda, M.N., Devera, E.E., Cabangon, R.J., and Ramos, H.J. (2012) "Effect of plasma modification on adhesion of properties of wood," *International adhesion and adhesives*, (32), 70-75.
- Adelina, R., Suliansyah, F., Syarief, A., and Warnita. (2017). "Kajian Teknik Budidaya Salak Sidimpunan (*Salacca sumatrana* Becc.)," *Grahatani*, 3(1), 434-443.
- Adiwijaya, I.N., And Yasa, I.M.R. (2015). "Pengaruh pupuk organik dan penjarangan buah terhadap produktivitas salak gula pasir," *Jurnal Pengkajian dan Pengembangan Teknologi Pertanian*, 18 (2), 195-206.
- Akhtar, M.N., Sulong, A.B., Radzib, F., Ismail, N.F, Razab, M.R., Muhamad, N and Khan, M.A. (2016). Influence of alkaline treatment and fiber loading on the physical and mechanical properties of kenaf/polypropylene composites for variety of applications. *Progress in Natural Science: Materials International*, 26, 657-664. <http://dx.doi.org/10.1016/j.pnsc.2016.12.004>.
- Akindoyo, J.O., Beg., M.D.H, and Ghazali, S.B. (2015). "Ultrasound enhanced structural modification of oil palm empty fruit bunch (OPEFB) fiber/poly(lactid) acid composite." National Conference on Postgraduate Studies. *Universiti Malaysia PAHANG, Kuantan*.
- Akrami, A., Fruehwald, A., and Barbu, M.C. (2014). "The effect of fine strands in core layer on physical and mechanical properties of oriented strand boards (OSB) made of beech (*Fagus sylvatica*) and poplar (*Populus tremula*)," *European Journal of Wood and Wood Product*, 72, 521–525. DOI 10.1007/s00107-014-0802-z.
- Alix, S., Philippe, E., Bessadok, A., Lebrun, L., Morvan, C dan Marais, S. (2009). "Effect of chemical treatments on water sorption dan mechanical properties of flax fibres," *Bioresource Technology*, 100, 4742-4749. doi:10.1016/j.biortech.2009.04.067.
- Alvarez, V. A., dan Vázquez, A. (2006). "Influence of fiber chemical modification procedure on the mechanical properties dan water absorption of sisal fiber composites," *Composites Part A: Applied Science and Manufacturing*, 37(10), 1672-1680.
- Amiandamhen, S.O., Meincken, M., and Tyhoda, L. (2018). "The effect of chemical treatments of natural fibres on the properties of phosphate-bonded composite products," *Wood Science Technology*, (52), 653–675.
- Amirou, S., Zerizer, A., Haddadou, I., And Merlin., A. (2013). "Effects of corona discharge treatment on the mechanical properties of biocomposites from polylactic acid and Algerian date palm fibres," *Academic Journals: Scientific Research and Essays*. 8(21), 946-952. DOI: 10.5897/SRE2013.5507.



- Amusant, N., Arnould, O., Pizzi, A., Depres, A., Mansouris, R.H., Bardet, S., and Baudass' e, C. (2009). "Biological properties of an OSB eco-product manufactured from a mixture of durable and non-durable species and natural resins," *European Journal Wood and Wood Product*, 67, 439–447. DOI:10.1007/s00107-009-0335-z.
- Arifin, H.S., Sardjono, M.A., Sundawati, L., Djogo, T., Wattimena, G.A., dan Widiyanto. (2003). "*Agroforestri di Indonesia*," World Agroforestry Centre (ICRAF) Southeast Asia. Bogor.
- Arnata, I.W., Suprihatin, Fahma, F., Richana, N., and Sunarti, T.C. (2019)," Cellulose Production from Sago Frond with Alkaline Delignification and Bleaching on Various Types of Bleach Agents," *Oriental Journal of Chemistry*, 35(1), 8-19.
- Ashari, S. (2002). "*On the agronomy and botany of Salak (Salacca zalacca)*," PhD Thesis, Wageningen University. 126 pp.
- Asim, M., Jawaid, M., Abdan, K., and Ishak, M.R. (2016). "Effect of alkali and silane treatments on mechanical and fibre-matrix bond strength of kenaf and pineapple leaf fibres," *Journal of Bionic Engineering*, (13), 426–435.
- ASTM D 1102-84. (2001). "*Standard test method for ash in wood*," ASTM International West Conshohocken, USA.
- ASTM D 3379-75. (1989). "*Standard test method for tensile strength and Young's modulus for high-modulus single-filament materials*," ASTM International, West Conshohocken, USA.
- ASTM D1103-84. (2013). "*Standard test method for alfa-cellulose in wood*," ASTM International, West Conshohocken, USA.
- ASTM D1104-84. (2013). "*Standard test method for holocellulose in wood*," ASTM International, West Conshohocken, USA.
- ASTM D1105-96. (2013). "*Standard test method for preparation of extractive-free wood*," ASTM International, West Conshohocken, USA.
- ASTM D1106-84. (2013). "*Standard test method for Acid insoluble lignin in wood*," ASTM International, West Conshohocken, USA.
- ASTM D1110-84. (2013). "*Standard test method for water solubility of wood*," ASTM International, West Conshohocken, USA.
- Bachtiar, D., Sapuan, S.M., Zainudin, E.S., Khalina, A., Dahlan, K.Z.M. (2010). "The tensile properties of single sugar palm (*Arenga pinnata*) fiber," *IOP Conference Series: Materials Science and Engineering*, 11, 012012.
- Baharin, A., Fattah, N.A., Bakar, A.A and Arif, Z.M. (2016)." Production of Laminated Natural Fibre Board from Banana Tree Wastes," *Procedia Chemistry*, 19: 999-1006. 5th International Conference on Recent Advances in Materials, Minerals and Environment (RAMM) & 2nd International Postgraduate Conference on Materials, Mineral and Polymer (MAMIP), 4-6 August 2015.
- Baley, C. (2002). "Analysis of the flax fibres tensile behaviour and analysis of the tensile stiffness increase," *Composite-Part A: Applied Science and manufacturing*, 33(7), 939-948. DOI: 10.1016/S1359-835X(02)00040-4.
- Barreto, A.C.H., Rosa, D.S., Fachine, P.B.A., dan Mazzetto, S.E. (2011). "Properties of sisal fibers treated by alkali solution dan their application into cardanol-based bio-composites," *Composites: Part A: Applied Science and Manufacturing*, 42, 492-500. doi:10.1016/j.compositesa.2011.01.008.



- Beck, K., Cloutier, A., Salenikovich, A., and Beauregard, R. (2010). "Comparison of mechanical properties of oriented strand board made from trembling aspen and paper birch," *European Journal Wood and Wood Product*, 68, 27-33. DOI 10.1007/s00107-009-0350-0.
- Beckermann, G. W., and Pickering, K. L. (2008). "Engineering dan evaluation of hemp fibre reinforced polypropylene composites: Fibre treatment and matrix modification," *Composites Part A: Applied Science and Manufacturing*, 39(6), 979-988. <https://doi.org/10.1016/j.compositesa.2008.03.010>.
- Bensadoun, F., Verpoest, I., Baets, J., Mu"ssig, J., Graupner, N., Davies, P., Gomina, M., Kervoele, A., and Baley, C. (2017). "Impregnated fibre bundle test for natural fibres used in composites," *Journal of Reinforced Plastics and Composites*. 0(0), 1-16. DOI: 10.1177/0731684417695461.
- Bledzki, A. K., Mamun, A. A, dan Volk, J. (2010). "Physical, chemical dan surface properties of wheat husk, rye husk dan soft wood dan their polypropylene composites," *Composites Part A: Applied Science dan Manufacturing*, 41(4), 480-488. DOI: 10.1016/j.compositesa.2009.12.004.
- Bledzki, A.K., and Gassan, J. (1999). "Composites reinforced with cellulose based fibres," *Progress in Polymer Science*, 24, 221-274.
- BPS. (2017e). "*Statistik Tanaman Bali*," Badan Pusat Statistik Provinsi Bali. Denpasar.
- BPS. (2017d). "*Statistik Tanaman Holtikultura Daerah Istimewa Yogyakarta*," Badan Pusat Statistika Provinsi Daereah Istimewa Yogyakarta. Yogyakarta.
- BPS. (2017a). "*Statistik Tanaman Holtikultura Jawa Tengah*," BPS Provinsi Jawa Tengah. Semarang.
- BPS. (2017c). "*Statistik Tanaman Holtikultura Jawa Timur*," BPS Provinsi Jawa Timur. Surabaya.
- BPS. (2017b). "*Statistik Tanaman Holtikultura Sumatera Utara*," BPS Provinsi Sumatera Utara. Medan.
- BPS. (2018). "*Statistik Indonesia Tahun 2018*," BPS Republik Indonesia. Jakarta
- BPS. (2014), "*Sensus pertanian 2013: angka nasional hasil pencacahan lengkap*. BPS Republik Indonesia. Jakarta.
- Boopathi, L., Sampath, P.S., dan Mylsamy, K. (2012). "Investigation of physical, chemical dan mechanical properties of raw dan alkali treated Borassus fruit fiber," *Composites-Part B*, 43, 3044-3052. <http://dx.doi.org/10.1016/j.compositesb.2012.05.002>.
- Borůvka, M., Ngaowthong, C., Běhál, L., Habr, J., and Lenfeld, P. (2016). "Effect of dielectric barrier discharge plasma surface treatment on the properties of pineapple leaf fiber reinforced poly (lactic acid) biocomposites," *Materials Science Forum*, DOI: 10.4028/www.scientific.net/MSF.862.156.
- Borysiak, S and Doczekalska, B. (2005). "X-ray diffraction study of pine wood treated with NaOH," *Forest and Textiles in Eastern Europe*, 13(5/53), 87-89.
- Boumediri, H., Bezazi, A., Del Pino, G.G., Haddad, A., Scarpa, F., Dufresne, A. (2009). "Extraction and characterization of vascular bundle and fiber strand from date palm rachis as potential bio-reinforcement in composite.



*Carbohydrate Polymers*, 222, 114997.  
<https://doi.org/10.1016/j.carbpol.2019.114997>.

- Branner, J. C. (1884). "The course and growth of the fibro-vascular bundles in palms." *Proceedings of the American Philosophical Society*. (21)115, 459-483+502. American Philosophical Society. Retrieved in [https://www.jstor.org/stable/982741?seq=1&cid=pdf-reference#references\\_tab\\_contents](https://www.jstor.org/stable/982741?seq=1&cid=pdf-reference#references_tab_contents). Accessed 21 September 2018.
- Brígida, A.I.S., Calado, V.M.A., Gonçalves, L.R.B., and Coelho, M.A.Z. (2010). "Effect of chemical treatments on properties of green coconut fiber," *Carbohydrate Polymers*, 79, 832-838.
- Cai, M., Takagi, H., Nakagaito, A.N., Katoh, M., Ueki, T., Waterhoused, G.I.N., dan Li, Y. (2015). "Influence of alkali treatment on internal microstructure dan tensile properties of abaca fiber," *Industrial Crops dan Products*, 65, 27-35. <http://dx.doi.org/10.1016/j.indcrop.2014.11.048>.
- Cai, M., Takagi, H., Nakagaito, A.N., Li, Y., and Waterhouse, G.I.N. (2016). "Effect of alkali treatment on interfacial bonding in abaca fiber-reinforced composites" *Composites-Part A: Applied Science and Manufacturing*, 90, 589-597. <http://dx.doi.org/10.1016/j.compositesa.2016.08.025>.
- Carlquist, S. (2012). "Monocot Xylem Revisited: New Information, New Paradigms," *Bot. Rev*, 78, 87-153. DOI 10.1007/s12229-012-9096-1
- Chaudhury, M., and Pocius, A.V. (2002). *"Adhesion Science and Engineering-2: Surfaces, Chemsitry and Applications,"* Elsevier Science, B.V. Sara Burgerhartstraat, Amsterdam, The Netherlands.
- Chen, G., Li, H., Zhou, T., Li, C., Song, Y., and Xu, R. (2015). "Experimental evaluation on mechanical performance of OSB webbed parallel strand bamboo I-joist with holes in the web," *Construction and building material*. 101, 91-98.
- Chen, H., Cheng, H., Jiang, Z., Qin, D., Yu, Y., Tian, G., Lu, F., Fei, B., and Wang, G. (2013). "Contact angles of single bamboo fibers measured in different environments and compared with other plant fibers and bamboo strips." *BioResources*, 8(2), 2827-2838.
- Chen, H., Fei, B., Wang, G., & Cheng, H. (2012). "Contact angles of single fibers measured in different temperature and related humidity," *Proceedings of the 55th International Convention of Society of Wood Science and Technology (August 27-31 2012, Beijing-China)*, 1(1), 2827-2838.
- Chen, H., Zhang, W., Wang, X., Wang, H., Wu, Y., Zhong, T., and Fei, B. (2018). "Effect of alkali treatment on wettability dan thermal stability of individual bamboo fibers," *Journal of Wood Science*, 64, 398-405. <https://doi.org/10.1007/s10086-018-1713-0>.
- Chowdhury, M.N.K., Beg, M.D.H., Khan, M.R., and Mina, M.F. (2013). "Modification of oil palm empty fruit bunch fibers by nanoparticle impregnation and alkali treatment," *Cellulose*, 20, 1477-1490. DOI: 10.1007/s10570-013-9921-7
- Ciannamea, E.M., Martucci, J.F., Stefani, P.M., and Ruseckaite, R.A. (2012)." Bonding quality of chemically-modified soybean protein concentrate-based adhesives in particleboards from rice husks" *Journal American Oil Chemsts Society*, 89, 1733-1741. DOI 10.1007/s11746-012-2058-2.



- Cruz, J., and Fangueiro, R. (2016). "Surface modification of natural fibers: a review," *International Symposium on "Novel Structural Skins: Improving sustainability dan efficiency through new structural textile materials dan designs*. Procedia Engineering, 155, 285-288.
- Darmanto, S., Purwadi, D., and Sarwoko. (2016). "Analisa perlakuan alkali dengan pengukusan terhadap kuat tarik dan tegangan interfacial serat pelepah salak," *Jurnal Mekanika*, 15(2), 8-11.
- Darmanto, S., Rahardjo, H.S.B., Jamasri and Widyorini, R. (2018). "Effect of sonifocation treatment on fibrillating snake fruit (*Salacca*) frond fiber," *AIP Conference Proceeding: The 3rd International Conference on Industrial, Mechanical, Electrical, and Chemical Engineering*, 030064-1-030064-7. <https://doi.org/10.1063/1.5024123>.
- Darmanto, S., Rohardjo, H.S.B., Jamasri, J., dan Widyorini, R. (2017a). "Effects of alkali dan steaming on mechanical properties of snake fruit (*Salacca*) fiber," *International Conference on Engineering, Science dan Nanotechnology 2016 (ICESNANO 2016)*, AIP Conf. Proc. 1788, 030060-1-030060-6. doi: 10.1063/1.4968313.
- Darmanto, S., Rohardjo, H.S.B., Jamasri, J., dan Widyorini, R. (2017b). "Effects of steaming dan steam explosion on mechanical properties of snake fruit (*Salacca*) fiber," *International journal of engineering dan technology*, 9(1), 150-157. DOI: 10.21817/ijet/2017/v9i1/170901410.
- Darmanto, S., Sarwoko., Sasono, E.J., Umardani, Y., and Sriyana. (2015). "Peningkatan kekuatan serat pelepah salak dengan perlakuan alkali dan pengukusan," *Prosiding science and Engineering National Seminar*, 8 Agustus 2015. Semarang.
- Darwis, A and Iswanto, A.H. (2018). "Morphological characteristics of *Bambusa vulgaris* and the distribution and shape of vascular bundles therein," *Journal of Korean Wood Science and Technology*. 46(4), 315-322.
- Darwis, A., Nurrochmat, D. R., Massijaya, M. Y., Nugroho, N., Alamsyah, E. M., Bachtiar, E. T., Safe'i, R. (2013). "Vascular bundle distribution effect on density and mechanical properties of oil palm trunk," *Asian Journal of Plant Science*, (12)5, 208-213.
- Darwis, A., Sumardi, I., Suhaya, Y., and Sunarya, S. (2018). "Characteristic of vascular bundles and morphology of *Gigantochloa apus* (J.A. and J.H. Schultes) Kurz Culm," *Asian Journal of Plant Science*, 17(3), 129-133.
- Datta, J., and Kopczyńska, P. (2015). "Effect of kenaf fibre modification on morphology and mechanical properties of thermoplastic polyurethane materials," *Industrial Crops and Products*, (74), 566-576.
- Davies, P., Morvan, C., Sire, O., and Baley, C. (2007). "Structure and properties of fibres from sea-grass (*Zostera marina*)," *J. Mater. Sci.* 42(13), 4850-4857.
- De Rosa, I. M., Kenny, J. M., Puglia, D., Santulli, C., and Sarasini, F. (2010a). "Morphological, thermal dan mechanical characterization of okra (*Abelmoschus esculentus*) fibres as potential reinforcement in polymer composites," *Composites Science dan Technology*, 70(1), 116-122.
- De Rosa, I. M., Santulli, C., and Sarasini, F. (2010b). "Mechanical dan thermal characterization of epoxy composites reinforced with random dan quasi-undirectional untreated *Phormium tenax* leaf fibers," *Materials & Design*, 31(5), 2397-2405.





- Deesoruth, A., Ramasawmy, H., and Chummun, J. (2014). Investigation in to the use of alkali treated screw pine (*Pandanus Utilis*) fibres as reinforcement in epoxy matrix. *International Journal Plant Technology*, 18(2), 263–279. DOI 10.1007/s12588-014-9082-z.
- Depuydt, D.E.C., Sweyggers, N., Appels, L., Ivens, J., and Vuure, A.W. (2019). “Bamboo fibres sourced from three global locations: A microstructural, mechanical and chemical composition study,” *Journal of Reinforced Plastics and Composites*, 38(9), 397-412.
- Dicker, M.P.M., Duckworth, P.F., Baker, A.B., Francois, G., Hazzard, M.K., and Weaver, P.M., (2014). “Green composite: a review of materila attributes and complementary applications,” *Composite-Part A: Applied Science and Manufacture*, (56), 280-289.
- Doczekalsca, B., and Zborowska, M. (2010). “Wood chemical composition of selected fast-growing species treated with NaOH part I: Structural Substance,” *Wood Research*, 55(1), 41-48.
- Dongsheng, H., Aiping, Z., and Yuling, B. (2013). “Experimental and analytical study on the linier bending of parallel strand bamboo beams,” *Construction and building material*, 44, 585-592.
- Dransfield, J., Uhl, N. W., Asmussen-Lange, C. B., Baker, W. J., Harley, M. M., and Lewis, C. E. (2005). "A new phylogenetic classification of the palm family, Arecaceae," *Kew Bulletin*, 60(4), 559-569. DOI: 10.2307/25070242.
- Dransfield, J., Uhl, N., Asmussen, C., Baker, W., Harley, M., and Lewis, C. (2008). “*Genera Palmarum. The Evolution and Classification of Palms*,” International Palm Society, The Hills, TX, USA.
- Dungani, R., Karliati, T., Hadiyane, A., Suheri, A., and Suhaya, Y. (2019).” Coconut fbres and laminates with Jabon trunk (*Anthocephalus cadamba* Miq.) veneer for hybrid plywood composites: dimensional stability and mechanical properties,” *European Journal of Wood and Wood Products*, 77, 749–759. <https://doi.org/10.1007/s00107-019-01432-9>.
- Duval, A., Bourmaud, A., Augier, L., dan Baley, C. (2011). “Influence of the sampling area of the stem on the mechanical properties of hemp fibers. *Materials letters*,” 65, 797-800. doi:10.1016/j.matlet.2010.11.053.
- Elanchezhiana, C., Ramnath, B.V., Ramakrishnan, G., Rajendrakumar, M., Naveenkumar, V., dan Saravanakumar, M.K. (2018). “Review on mechanical properties of natural fiber composites,” *Materials Today: Proceedings*, 5, 1785-1790.
- Fang, L. X., Qin-hui, C., Jin-huo, L., Dong-xian, Z., and Xiu-ling, W. (2008). “Acetylation of Chinese bamboo flour and thermoplasticity,” *Journal of Forestry Research*. 19(1), 69–7.
- FAO. (2020). “*World food and agriculture: statistical yearbook 2020*” Rome, <https://doi.org/10.4060/cb1329en>.
- Faruk, O., Bledzki, A.K., Fink, H.P., and Sain, M. (2012). “Biocomposites reinforced with natural fibers: 2000–2010,” *Progress in Polymer Science*, 37(11), 1552-1596. <http://dx.doi.org/10.1016/j.progpolymsci.2012.04.003>.
- Fathi, L., and Frühwald, A. (2014). “The role of vascular bundles on the mechanical properties of coconut palm wood,” *Wood Material Science and Engineering*, <http://dx.doi.org/10.1080/17480272.2014.887774>.



- Fathi, L., Frühwald, A., and Koch, G. (2014). "Distribution of lignin in *vascular* bundles of lignification and tensile strength in single UV-spectroscopy and relationship between coconut wood (*Cocos nucifera*) by cellular *vascular* bundles," *Holzforschung*, 68(8), 915-925.
- Fauziyah, E., Ruhimat, I.S., dan Achmad, B. (2013). "Kelembagaan hutan rakyat agroforestri di Kabupaten Banjarnegara," *Prosiding seminar nasional agroforestry*, pp: 475-480.
- Febrianto, F., Jang, J., Lee, S., Santoso, I.A., Hidayat, W., Bakar, E.S., Kwon, J., and Kim, N. (2015). "Effect of bamboo species and resin content on properties of oriented strand board prepared from steam-treated bamboo strand," *BioResources*, 10(2), 2642-2655.
- Febrianto, F., Sahroni, Hidayat, W., Bakar, E.S., Kwon, G., Kwon, J., Hong, S., and Kim, N. (2012). "Properties of oriented strand board made from Betung bamboo (*Dendrocalamus asper* (Schultes.f) Backer ex Heyne), " *Wood. Sci. Technol*, 46, 53–62. DOI 10.1007/s00226-010-0385-8.
- Fuentes, C.A., Trana, L.Q.N, Dupont-Gillain, C., Vanderlinden, W., Feyter, S.D., Vuurea, A.W.V., and Verpoest, I. (2011). "Wetting behaviour and surface properties of technical bamboo fibres," *Colloids and surfaces A: physicochem. Eng. Aspects*, 280, 89-99. doi:10.1016/j.colsurfa.2011.02.032
- Fuqua, M.A., Huo, S., and Ulven, C.A. (2012). "Natural fiber reinforced composites," *Polym Rev*, (52), 259-320.
- Ganapathy, T., Sathiskumar, R., Senthamaraiannan, P., Saravanakumar, S.S., and Khan, A. (2019). "Characterization of raw dan alkali treated new natural cellulosic fibres extracted from the aerial roots of banyan tree," *International Journal of Biological Macromolecules*, 138, 573-581. <https://doi.org/10.1016/j.ijbiomac.2019.07.136>.
- Gassan, J., and Bledzki, A.K. (1999). "Possibilities for improving the mechanical properties of jute/epoxy composites by alkali treatment of fibres," *Composites Science and Technology*, 59, 1303-1309.
- Gholampour, A., and Ozbakkaloglu, T. (2020). A review of natural fiber composites: properties, modification and processing techniques, characterization, applications. *Journal of Material Science*. 55, 829–892.
- Gomes, A., Goda, K., and Ohgi, J. (2004). "Effects of alkali treatment to reinforcement on tensile properties of curaua fiber green composites," *JSME International Journal*, 47, 541–546.
- Gonzalez, O. M., and Nguyen, K. A. (2016). "Cocowood fibrovascular tissue system-Another wonder of plant evolution," *Front. Plant Sci*, 7(1141), 1-12. DOI: 103389/fpls.2016.01141.
- Grosser, D., and Liese, W. (1971). "On the anatomy of Asian bamboos, with special reference to their *vascular* bundles," *Wood Science and Technology* 5(4), 290-312. DOI: 10.1007/BF00365061.
- Gurunathan, T., Mohanty, S., and Nayak, S.K. (2015). "A review of the recent developments in biocomposites based on natural fibres and their application perspectives," *Compos Part A: Appl Sci Manuf*, 77, 1-25
- Hadiati, S., Budiyanti, T., Soemargono, A., and Susiloadi, A., (2012). "Characterization of fruit on several salak varieties and their hybrids," *Agrivita*, (34)2, 187-192.



- Hakim, L., and Febrianto, F., (2006). "Physical and mechanical properties of composite board made from banana fiber (*Musa sp*) pretreated with alkali," *Proceeding of the 8th Pacific Rim Bio-Based Composites Symposium, Kuala Lumpur*.
- Hakim, L., Herawati, E., and Wistara., I.N.J., (2012). "Medium density of fiberboard made from acetylation slude from paper mill," *Makara seri Teknologi*, 15(2), 15-22.
- Hasibuan, L., Rauf, A., and Putri, L. A. P. (2013). "The Agroecology Character Study of Padangsidimpuan Salak Plantation Based on Productive Potency in South Tapanuli," *Jurnal Ilmu Pertanian Kultivar*. 7(1), 44-51.
- Herawati, W., Amurwanto, A., Nafi'ah, Z., Ningrum, A. M., and Samiyarsih, S. (2018). "Variation analysis of three Banyumas local salak cultivars (*Salacca zalacca*) based on leaf anatomy and genetic diversity," *Biodiversitas*. 19(1), 119-125.
- Hermawan, A., Ohuchi, T., Tashima, R., and Murase, Y. (2007). "Manufacture of strand board made from construction scrap wood," *Resources, Conservation, and Recycling*, 50(4), 415-426. DOI: 10.1016/j.resconrec.2006.07.002.
- Hill, C.A.S. (2006). "Wood Modification Chemical, Thermal and Other Processes," *ohn Wiley & Sons, Ltd. Bangor, England*.
- Huang, J., Liu, W., Zhou, F., Peng, Y., and Wang, N. (2016). "Mechanical properties of maize fibre bundles and their contribution to lodging resistance," *Biosystems Engineering*, 151, 298-307. DOI: 10.1016/j.biosystemseng.2016.09.016
- Hubbe, M.A., Gardner, D.J., and Shen, W. (2015). "Contact Angles and Wettability of Cellulosic Surfaces: A Review of Proposed Mechanisms and Test Strategies," *BioResources*, 10(4), 8657-8749.
- Hung, K-C. and Wu, J-H. (2010). "Mechanical and interfacial properties of plastic composite panels made from esterified bamboo particles," *J Wood Sci*, (56), 216-221.
- Ishak, Z.A.M., Ariawan, D., Salim, M.S., Taib, R.M., Thirmizir, A. and Phua, Y.J. (2014), "The effect of alkalization on the mechanical and water absorption properties of non-woven kenaf fiber/unsaturated-polyester composites produced by resin-transfer molding (RTM)," ECCM16 -16TH, *European conference on composite materials*, Seville, Spain, 22-26 June 2014
- Islam, M.R., Beg, M.D.H., Gupta, A., and Mina, M.F. (2015). "Optimal Performances of Ultrasound Treated Kenaf Fiber Reinforced Recycled Polypropylene Composites as Demonstrated by Response Surface Method," *J. Appl. Polym. Sci.* (2012), 1-10.
- Islam, M.S., Hamdan, S., Jusoh, I., Rahman, M.R., dan Ahmed, A.S. (2012). "The Effect of Alkali Pretreatment on mechanical and morphology Properties of tropical wood polymer composites," *Materials and Design*, (33), 419-424.
- Izani, M.A.N., Paridah, M.T., Anwar, U.M.K., Nor, M.Y.M., and H'ng, P.S. (2013). "Effects of fiber treatment on morphology, tensile dan thermogravimetric analysis of oil palm empty fruit bunches fiber," *Composites: Part B*, 45, 1251-1257. <http://dx.doi.org/10.1016/j.compositesb.2012.07.027>.





- Izani, M.A.N., Paridah, M.T., Astimar, A.A., Nor, M.Y.M., and Anwar U.M.K. (2012). "Mechanical and dimensional stability properties of medium density fiberboard produced from treated oil palm empty fruit bunches," *Journal of Applied Science*, 12(6), 561-567. DOI: [10.3923/jas.2012.561.567](https://doi.org/10.3923/jas.2012.561.567).
- Jahan, M.S., Chowdhury, D.A.N., and Islam, M.K. (2006). "Characterization and evaluation of golpata fronds as pulping raw materials," *Bioresource Technology*, 97, 401-406.
- Jansen, S., Kitin, P., De Pauw, H., Idris, M., Beeckman, H., and Smets, E. (1998). "Preparation of wood specimens for transmitted light microscopy and scanning electron microscopy," *Belgian Journal of Botany*, 131(1), 41-49.
- JAS 003 (2003). "Plywood" Japan Agricultural Standard. Japan.
- Jawaid, M., and Khalil, H.P.S.A. (2011). "Cellulosic/synthetic fibre reinforced polymer hybrid composites: a review," *Carbohydr Polym*, 86(1), 1-18.
- JIS A 5908 (2003). "Particleboard". Japan Industrial Standard. Japan
- Joonobi, M., Harun, J., Shakeri, A., Misra, M., and Oksman, K. (2009). "Chemical composition, crystallinity, dan thermal degradation of bleached dan unbleached kenaf bast (*Hibiscus cannabinus*) pulp dan nanofibers," *BioResources*, 4(2), 626-639. DOI: [10.15376/biores.4.2.626-639](https://doi.org/10.15376/biores.4.2.626-639)
- Joshi, L.D., Rajgole, A.A., Hiremath, R., and Khomane, S. (2019). "Experimental investigation of natural fiber with epoxy resin," *International Journal of New Technology and Research*, 5(4), 44-47.
- Juliana A.H., Paridah, M.T. and Anwar, U.M.K. (2012). "Properties of three-layer particleboards made from kenaf (*Hibiscus cannabinus* L.) and rubberwood (*Hevea brasiliensis*)," *Materials and Design*, 40, 59-63. <http://dx.doi.org/10.1016/j.matdes.2012.03.030>.
- Kabir, M.M., Wang, H., Lau, K.T., and Cardona, F. (2012). "Chemical treatments on plant-based natural fibre reinforced polymer composites: An overview," *Composites: Part B*, 43, 2883-2892.
- Kabir, M.M., Wang, H., Lau, K.T., and Cardona, F. (2013a). "Effects of chemical treatments on hemp fibre structure," *Applied Surface Science*, 276, 13-23.
- Kabir, M.M., Wang, H., Lau, K.T., and Cardona, F. (2013b). "Tensile properties of chemically treated hemp fibres as reinforcement for composites," *Composites: Part B*, 53, 362:368. <http://dx.doi.org/10.1016/j.compositesb.2013.05.048>.
- Kaliky, R., Widodo, S., and Hidayat, N. (2006). "Persepsi petani terhadap pemanfaatan pelepah daun salak untuk industri pulp dan konservasi lingkungan pertanaman salak pondoh di kabupaten sleman," *Temu Teknis Nasional Tenaga fungsional, Pusat penelitian dan Pengembangan Peternakan*, 491-497.
- Kaul, K. N. (1981). "Anatomy of palm stems-II." *The Palaeobotanist*. 28-29, 447-454.
- Kawai, S., Sasaki, H., Nakaji, M., Makiyama, S., and Morita S. (1986). "Physical properties of low-density fiberboard," *Wood research: bulletin of the Wood Research Institute Kyoto University*, (72), 27-36.
- Kementerian Pertanian RI. (2015). "Statistik Produksi Hortikultura Tahun 2014," Direktorat Jenderal Hortikultura, Kementan RI. Jakarta.
- Khakpour, H., Ayatollahi, M.R., Akhavan-Safar, A., and da Silva, L.F.M. (2020). "Mechanical properties of structural adhesives enhanced with natural date



- palm tree fibers: Effects of length, density and fiber type,” *Composite structures*, 237, 111950. <https://doi.org/10.1016/j.compstruct.2020.111950>.
- Khalil, H. P. S. A., Alwani, M. S., Ridzuan, R., Kamarudin, H., and Khairul, A. (2008). “Chemical composition, morphological characteristics, and cell wall structure of Malaysian oil palm fibers,” *Polymer-Plastics Technology and Engineering*, 47(3), 273-280. DOI: 10.1080/03602550701866840
- Kose, R., Utsumi, M., Yatsui, H., Tun-Abdul-Aziz, M.K., and Okayama, T. (2018). “Wettability of the fine fibre sheet prepared from oil palm empty fruit bunches,” *Journal of Tropical Forest Science*, 30(4), 546-553.
- Kostic, M., Pejic, B., and Skundric, P. (2008). “Quality of chemically modified hemp fibers,” *Bioresource Technology*, 99, 94-99.
- Krishnaiah, P., Ratnam, C.T., and Manickam, S. (2017). “Enhancements in crystallinity, thermal stability, tensile modulus dan strength of sisal fibres dan their PP composites induced by the synergistic effects of alkali dan high intensity ultrasound (HIU) treatments,” *Ultrasonics Sonochemistry*, 34, 729-742. <http://dx.doi.org/10.1016/j.ultsonch.2016.07.008>.
- Kundu, S.P., Chakraborty, S., Majumder, S.B., and Adhikari, B. (2018). “Effectiveness of the mild alkali dan dilute polymer modification in controlling the durability of jute fibre in alkaline cement medium,” *Construction dan Building Materials*, 174, 330-342. <https://doi.org/10.1016/j.conbuildmat.2018.04.134>.
- Kurniawan, Rohardjo, H.S.B., and Darmanto, S. (2017). “Pengaruh perlakuan alkali dan steaming terhadap kekuatan tarik serat tunggal pelepah salak (*salacca zalacca*),” *Seminar Nasional Teknologi dan Rekayasa (SENTRA) 2017*. eISSN (Online) 2527-6050.
- Kusumah, S.S., Umemura, K., Guswenrivo, I., Yoshimura, T., and Kanayama, K. (2017). “Utilization of sweet sorghum bagasse and citric acid for manufacturing of particleboard II: influences of pressing temperature and time on particleboard properties,” *J Wood Sci*, 63, 161–172.
- Kusumah, S.S., Umemura, K., Yoshioka, K., Miyafuji, H., and Kanayama, K. (2016). “Utilization of sweet sorghum bagasse and citric acid for manufacturing of particleboard I: effect of pre-drying treatment and citric acid content on the board properties,” *Ind. Crops. Prod.* 84, 34-42.
- Lai, W. L., Mariatti, M., and Mohamad, S. J. (2008). “The properties of woven kenaf dan betel palm (*Areca catechu*) reinforced unsaturated polyester composites,” *Polymer- Plastics Technology dan Engineering*, 47(12), 1193-1199. DOI: 10.1080/03602550802392035.
- Latibari, A.J., Hossein, M.A., and Hosseinpour, R. (2011). “Application of alkaline sulfite pulping on corn stalks,” *BioResources*, 6(1), 48-68.
- Law, K-N., Daud, W. R. W., and Ghazali, A. (2007). “Morphological and chemical nature of fiber strands of oil palm empty-fruit bunch (OPEFB),” *BioResources*, 2(3), 351-365.
- Leslaw, K. (2016). “Reinforcing wood by surface modification,” *Composite Structures*, 158, 64-71.
- Li, H., and Shen, S. (2011). “The mechanical properties of bamboo and vascular bundles.” *J. Mater. Sci*, 26(21), 2749-2756. DOI: 10.1557/jmr.2011.314.



- Li, X., Tabil, L.G., and Satyanarayan P. (2007). "Chemical treatments of natural fiber for use in natural fiber-reinforced composites: A review". *J. Polym. Environ*, 15, 25-33. DOI 10.1007/s10924-006-0042-3.
- Liao, R., Xu, J., and Umemura, K. (2016). "Low density sugarcane bagasse particleboard bonded with citric acid and sucrose: effect of board density and additive content," *BioResources*, 11(1), 2174-2185.
- Lim, T.K. (2012). "Salacca zallaca," In: *Edible medicinal and non-medicinal plant*. Vol. 1, fruit. Springer-Netherland.
- Liu, D., Han, G., Huang, J., and Zhang, Y. (2009). "Composition dan structure study of natural *Nelumbo nucifera* fiber," *Carbohydrate Polymers*, 75(1), 39-43.
- Liu, W., Mohanty, A. K., Drzal, L. T., Askel, P., and Misra, M. (2004). "Effects of alkali treatment on the structure, morphology dan thermal properties of native grass fibers as reinforcements for polymer matrix composites," *Journal of Materials Science*, 39(3), 1051-1054.
- Loganathan, T.M., Sultan, M.T.H., Ahsan, Q., Jawaid, M., Naveen, J., Shah, A.U.M., and Hua, L.S. (2020). "Characterization of alkali treated new cellulosic fibre from *Cyrtostachys renda*," *Journal of Material research and technology*, 9(3), 3537-3546. <https://doi.org/10.1016/j.jmrt.2020.01.091>.
- Loong, M.L., and Cree, D. (2018). "Enhancement of mechanical properties of bio-resin epoxy/flax fiber composites using acetic anhydride," *J Polym Environ*, 26, 224–234.
- Low, K.S., Lee, C.K., and Mak, S.M. (2004). "Sorption of copper and lead by citric acid modified wood," *Wood.Sci.Technol.* 38:629-640.
- Lu, N., and Oza, S. (2013). "Thermal stability dan thermo-mechanical properties of hemp-high density polyethylene composites: Effect of two different chemical modification," *Composites: Part B*, 44, 484-490. <http://dx.doi.org/10.1016/j.compositesb.2012.03.024>.
- Lu, N., Oza, S., and Tajabadi, M.G. (2015). "Surface modification of natural fibers for reinforcement in polymeric composites in: *Surface Modification of Biopolymers*," First Edition. Edited by Vijay Kumar Thakur and Amar Singh Singha. John Wiley & Sons, Inc.
- Luo, H., Yue, L., Wang, N., Zhang, H., and Lu, X. (2014). "Manufacture of binderless fiberboard made from bamboo processing residues by steam explosion pretreatment," *Wood Research*, 59(5), 861-870.
- Ma, G., Yan, L., Shen, W., Zhu, D., Huang, L., and Kasal B. (2018). "Effects of water, alkali solution dan temperature ageing on water absorption, morphology dan mechanical properties of natural FRP composites: Plant-based jute vs. mineral-based basalt," *Composites: Part B*, 153, 398-412. <https://doi.org/10.1016/j.compositesb.2018.09.015>.
- Majid, R.A., Ismail, H., and Taib, R.M. (2016). "Benzoyl chloride treatment of kenaf core powder: the effects on mechanical and morphological properties of PVC/ENR/kenaf core powder composites," *Procedia Chemistry*, (19), 803-809.
- Malanit, P., Barbu, M.C., and Frühwald, A. (2011). "Physical and mechanical properties of oriented strand lumber made from an Asian bamboo (*Dendrocalamus asper* Backer)," *Eur. J. Wood Prod*, 69, 27–36. DOI 10.1007/s00107-009-0394-1.



- Maloney, T (1993). "Modern particleboard and dry process fibreboard manufacturing. San Francisco, USA: Miller Freeman Publications, Inc.
- Marra, A.A. (1992). Technology of Wood Bonding : Principles in Practice (VNR Structural Engineering). Van Nostrand Reinhold. United State of America.
- Medina, J.D.C., Woiciechowski, A., Filho, A.Z., Nosedá, M.D., Kaur, B.S., and Soccol, C.R. (2015). "Lignin preparation from oil palm empty fruit bunches by sequential acid/ alkaline treatment-A biorefinery approach," *Bioresource Technology*, 194, 172-178. <http://dx.doi.org/10.1016/j.biortech.2015.07.018>.
- Mesquita, A.L., Barrero, N.G., Fiorelli, J., Christoforo, A.L., Faria, L.J.G.D., and Lahr, F.A.R. (2018). "Eco-particleboard manufactured from chemically treated fibrous *vascular* tissue of acai (*Euterpe oleracea* Mart.) Fruit: A new alternative for the particleboard industry with its potential application in civil construction and furniture," *Industrial Crops and Products*, 112, 644-651. <https://doi.org/10.1016/j.indcrop.2017.12.074>.
- Mogea, J. P. (1986). "A new species in the genus *Salacca*," *Principes* 30(4), 161-164.
- Mogea, J.P. (1980). "The flabellata-leaved species of *Salacca* (Palmae)," *Reinwardtia. Journal on taxonomic botany, plant sociology and ecology*. (9)4, 461-470.
- Mohan, T.P., and Kanny, K. (2012). "Chemical treatment of sisal fiber using alkali and clay method," *Composites: Part A*: 43: 1989-1998.
- Mohanty, A. K., Misra, M., and Drzal, L.T. (2001). "Surface modifications of natural fibers and performance of the resulting biocomposites: An overview," *Composite Interfaces*, 8(5), 313-343.
- Moradbak, A., Tahir, P.Md., Mohamed, A.Z., and Halis, R. (2016). "Alkaline sulfite anthraquinone dan methaonol pulping of bamboo (*Gigantochloa scortechinii*)," *BioResources*, 11(1), 235-248.
- Mukesh, and Godara, S.S. (2019). "Effect of chemical modification of fiber surface on natural fiber composites: A review," *Materials Today: Proceedings*, 18, 3428-3434.
- Munawar, S. S., Umemura, K., and Kawai, S. (2007). "Characterization of the morpho-logical, physical, and mechanical properties of seven nonwood plant fiber bundles," *Journal of Wood Science*, 53(2), 108-113. DOI: 10.1007/s10086-006-0836-x.
- Munawar, S.S., Umemura, K., and Kawai, S. (2008a). "Manufacture of oriented board using mild steam treatment of plant fiber bundles," *J Wood Sci*, 54, 369-376. DOI 10.1007/s10086-008-0968-2.
- Munawar, S.S., Umemura, K., Tanaka, F, dan Kawai, S. (2008b) "Effects of alkali, mild steam, dan chitosan treatments on the properties of pineapple, ramie, dan sansevieria fiber bundles," *J. Wood Sci*. 54, 28-35. DOI 10.1007/s10086-007-0903-y.
- Mwaikambo, L. Y., and Ansell, M. P. (2002). "Chemical modification of hemp, sisal, jute, dan kapok fibers by alkalization," *Journal of Applied Polymer Science*, 84(12), 2222-2234.
- Mwaikambo, L.Y., and Ansell, M.P. (1999). "The effect of chemical treatment on the properties of hemp, sisal, jute and kapok for composite reinforcement," *Die Angewandte Makromolekulare Chemie*. 272, 108-116.





- Nakano, T. (2010). "Mechanism of microfibril contraction and anisotropic dimensional changes for cells in wood treated with aqueous NaOH solution," *Cellulose*, (17), 711-719.
- Nishimura, T. (2015). Chapter 6 : "Chipboard, Oriented strand board (OSB) and structural composite lumber," In : *Wood Composite edited by: Martin ansell*. Elsevier. Netherland.
- Olivato, J.B., Müller, C.M.O., Carvalho, G.M., Yamashita, F., and Grossmann, M.V.E. (2014). "Physical and structural characterisation of starch/polyester blends with tartaric acid," *Materials Science and Engineering C*. 39, 35-39. <http://dx.doi.org/10.1016/j.msec.2014.02.020>.
- Osabor, V.N., Egbung, G.E., and Okafor, P.C. (2008). "Chemical profile of *Nypa fruticans* from cross River Estuary, South Eastern Nigeria. *Pakistan Journal of Nutrition*," 7(1), 146-150.
- Ouarhima, W., Essabira, H., Bensalahb, M-O., Zaria, N., Bouhfida, R., and Qaiss, A.K. (2018). "Structural laminated hybrid composites based on raffia and glass fibers: Effect of alkali treatment, mechanical and thermal properties," *Composites Part B*, 154: 128-137. <https://doi.org/10.1016/j.compositesb.2018.08.004>.
- Oudaini, A., Chaabouni, A., Msahli, S., and Sakli, F. (2011). "Crystal transition from cellulose I to cellulose II in NaOH treated *Agave americana* L. fibre," *Carbohydrate polymer*, 86, 1221-1229. <https://doi.org/10.1016/j.carbpol.2011.06.037>.
- Oushabi, A., Sair, S., Hassani, O., Abboud, Y., Tanane, O., and El-Bouari, A. (2017). "The effect of alkali treatment on mechanical, morphological dan thermal properties of date palm fibers (DPFs): Study of the interface of DPF-Polyurethane composite," *South african journal of chemical engineering*, 23, 116-123. <http://dx.doi.org/10.1016/j.sajce.2017.04.005>.
- Ozmen, N. (2012). "A study of the effect of acetylation on hemp fibres with vinyl acetate," *BioResources*, 7(3): 3800-3809.
- Pareek, O.P and Sharma, S. (2009). "*Underutilized fruit and nuts. Vol.2: Fruit and tropical region*," Aavishkar Publishers, Distributors Jaipur 302 003 (Raj.) India.
- Pickering, K. L., Beckermann, G. W., Alam, S. N., and Foreman, N. J. (2007). "Optimising industrial hemp fibre for composites," *Composites Part A: Applied Science dan Manufacturing*, 38(2), 461-468. <https://doi.org/10.1016/j.compositesa.2006.02.020>
- Pickering, K. L., Efendy, M. G. A., and Le, T. M. (2016). "A review of recent developments in natural fibre composites and their mechanical performance," *Composites Part A: Applied Science and Manufacturing* 83, 98-112. DOI: [10.1016/j.compositesa.2015.08.038](https://doi.org/10.1016/j.compositesa.2015.08.038)
- Pizzi A, and Mittal, K.L. (2003). "*Handbook of Adhesive Technology*": Second edition, Revised and Expanded. Marcel Dekker Inc. New York.
- Prasetyo, B.D., Widyorini, R., and Prayitno, T.A. (2016). "Pengaruh penggunaan bahan baku pelepah salak dan jumlah asam sitrat terhadap sifat fisika dan mekanika papan partikel," *Prosiding seminar nasional MAPEKI XVIII*, Bandung : 4-5 November 2015.
- Prasetyo, B.D., Widyorini, R., and Prayitno, T.A. (2017). "Mutu Papan Partikel Pelepah Salak Tiga Lapis Berperekat Asam Sitrat," *J. Ilmu Teknol. Kayu*



*Tropis*, 15(2), 185-192.

- Qurniati, R and Haryono, D. (2013). "Development of agroforestry for livelihood security: case study of pesawaran indah village, pesawaran district, indonesia," *Proceeding: the 14th Global Conference of the International Association for the Study of the Commons (IASC)*, Kitafuji, Jepang (3-8 Juni 2013).
- Rachini, A., Troedec, M.L., Peyratout, C., and Smith, A. (2012). "Chemical Modification of Hemp Fibers by Silane Coupling Agents," *Journal of Applied Polymer Science*, 123, 601-610.
- Ramle, S.F.M., Sulaiman, O., Hashim, R., Arai, T., Kosugi, A., Abe, H., Murata, Y., and Mori, Y. (2012). "Characterization of parenchyma and vascular bundle of oil palm trunk as function of storage time," *Lignocellulose*, 1(1), 33-44.
- Rawana. (2009). "The study of agarwood (*Aquilaria filaria*) plantation growth in the Merapi mountain area with agroforestry system in Sleman," Yogyakarta Province, Indonesia., *Proceeding of World Congress of Agroforestry (WCA)*, Nairobi, Kenya, Agustus 2009.
- Razera, I. A. T., and Frollini, E. (2003). "Composites based on jute fibers and phenolic matrices: proper- ties of fibers and composites," *Journal of Applied. Polymer Science*. 91, 1077-1085.
- Rebollar, M., Perez, R., and Vidal, R. (2007). "Comparison between oriented strand boards and other wood-based panels for the manufacture of furniture," *Materials and Design*. 28, 882-888.
- Rohardjo, H. S. B., and Ridlo, M. (2019). "Effects of Fiber Contents on Wear Resistance of Salacca zalacca Frond Fiber Reinforced Phenolic," *Material Science forum* 948: 181-185. doi:10.4028/www.scientific.net/MSF.948.18.
- Roshetko, J.M., Martini, E., Tarigan, J., Manurung, G., Budidarsono, S., Wijaya, K., Tukan, J.C., Kurniawan, I., Galudra, G., Nugroho, D.K., Ekadinata, A., Dewi, S., Lusiana, D.H.B., Noordwijk, M.V., and Purba, J. (2007). "Agroforestry on the Interface of Orangutan Conservation and Sustainable Livelihoods in Batang Toru (North Sumatra)," Working Paper no. 56. World Agroforestry Centre, Bogor, Indonesia.
- Rowell, R.M, (2008). "Properties and performance of natural fiber composites: Chapter I Natural Fibres: types and properties," edited by: Pickering, K.L., Woodhead Publishing and Maney Publishing. CRC Press. Cambridge-England.
- Rowell, R.M. (1997). "Chemical modification of agro-resources for property enhancement," in: paper and composites from agro-based resources. Edited by R.M. Rowell *et al.* CRC Press, Florida. USA.
- Rowell, R.M. (1998). "Property enhanced natural fiber composite materials based on chemical modification," in: *Science and Technology of Polymers and Advanced Materials*. Edited by P. N. Prasad *et al.*, Plenum Press, New York. USA.
- Rowell, R.M. (2004). "Acetylation of natural fibers to improve performance," *Mol. Cryst. Liq. Cryst.* (418), 153[881]–164[892].
- Rüggeberg, M., Speck, T., and Burgert, I. (2009). "Structure–function relationships of different vascular bundle types in the stem of the Mexican fanpalm (*Washingtonia robusta*)," *New Phytologist* 182, 443-450. DOI:



10.1111/j.1469-8137.2008.02759.x.

- Saadaoui, N., Rouilly, A., Fares, K., and Rigal, L. (2013). "Characterization of date palm lignocellulosic by-products and self-bonded composite materials obtained thereof," *Materials and Design*, 50, 302-308. <http://dx.doi.org/10.1016/j.matdes.2013.03.011>.
- Sackey, E.K., Semple, K.E., Oh, S., and Smith, G.D. (2008). "Improving core bond strength of particleboard through particle size redistribution," *Wood and Fiber Science*, 40(2), 214-224.
- Sair, S., Oushabi, A., Kammouni, A., Tanane, O., Abboud, Y., Hassani, F.O., Laachachi, A., and El Bouari, A. (2017). "Effect of surface modification on morphological, mechanical and thermal conductivity of hemp fiber: Characterization of the interface of hemp-Polyurethane composite," *Case Studies in Thermal Engineering*, (17), 157-162.
- Santhoshkumar, R., and Bath, K. V. (2014). "Variation in density and its relation to anatomical properties in bamboo culms, *Bambusa Bambos* (L) Voss," *Journal of plant science*, 2(3), 108-112. DOI: 10.11648/j.jps.20140203.12
- Santoso, M., Widyorini, R., Prayitno, T. A., and Sulisty, J. (2017). "Bonding performance of maltodextrin and citric acid for particleboard made from nipa fronds," *Journal of Korean Wood Science and Technology*, 45(4), 432-443. DOI: 10.5658/WOOD.2017.45.4.432.
- Sapathkumar, D., Punyamurthya, R., Bennehall, B., and Venkateshappa, S.C. (2015). "Physical characterization of natural lignocellulosic single areca fiber." *Ciência & Tecnologia dos Materiais*. (27), 121-135.
- Sathishkumar, S., Suresh, A.V., Nagamadu, M., and Krishna, M. (2017). "The effect of alkaline treatment on their properties of Jute fiber mat and its vinyl ester composites," *5th International Conference of Materials Processing and Characterization (ICMPC 2016)*. *Materials Today: Proceedings* 4, 3371-3379.
- Satyanarayana, K. G., Pillai, C. K. S., Sukumaran, K., Pillai, S. G. K., Rohatgi, P. K., and Vijayan, K. (1982). "Structure property studies of fibres from various parts of the coconut tree," *Journal of Materials Science*, 17(8), 2453-2462. DOI: 10.1007/BF00543759.
- Satyanarayana, K.G., Arizaga, G.G.C., and Wypych, F. (2009). "Biodegradable composites based on lignocellulosic fibers-An overview," *Progress in Polymer Science*, 34, 982-1021. doi:10.1016/j.progpolymsci.2008.12.002.
- Schellbach, S.L., Monteiro, S.N., and Drelich, J.W. (2016). "A novel method for contact angle measurements on natural fiber," *Materials Letters*, 164, 599-604. <http://dx.doi.org/10.1016/j.matlet.2015.11.039>.
- Segal, L., Creely, J. J., Martin, A. E., and Conrad, C. M. (1959). "An empirical method for estimating the degree of crystallinity of native cellulose using X-ray diffractometer," *Textile Research Journal*, 29(10), 786-794.
- Senthamaraiannan, P., and Kathiresan, M. (2018). "Characterization of raw and alkali treated new natural cellulosic fiber from *Coccinia grandis*. L," *Carbohydrate Polymers*, 186, 332-343.
- Senthamaraiannan, P., Saravanakumar, S. S., Arthanarieswaran, V. P., and Sugumaran, P. (2016). "Physico-chemical properties of new cellulosic fibers from the bark of *Acacia planifrons*," *International Journal of Polymer Analysis and Characterization*, 21(3), 207-213.



- Sghaier, A.E.O.B., Chaabouni, Y., Msahli, S., and Sakli, F. (2012). "Morphological dan crystalline characterization of NaOH dan NaOCl treated *Agave americana* L. fiber," *Industrial Crops dan Products*, 36, 257-266. doi:10.1016/j.indcrop.2011.09.012.
- Shah, A.U.R., Prabhakar, M.N., and Song, J.I. (2017). "Current Advances in the Fire Retardancy of Natural Fiber dan Bio-Based Composites-A Review," *International Journal of Precision Engineering dan Manufacturing-Green Technology*, 4(2), 247-262. DOI: 10.1007/s40684-017-0030-1.
- Shanmugasundaram, N., Rajendran, I., and Ramkumar, T. (2018). "Characterization of untreated dan alkali treated new cellulosic fiber from an Areca palm leaf stalk as potential reinforcement in polymer composites," *Carbohydrate Polymers*, 195, 566-575. <https://doi.org/10.1016/j.carbpol.2018.04.127>.
- Shinoja, S., Visvanathan, R., Panigrahi, S., and Kochubabu, M. (2011). "Oil palm fiber (OPF) dan its composites: A review," *Industrial Crops dan Products*, 33, 7-22. doi:10.1016/j.indcrop.2010.09.009.
- Shireesha, Y., and Ndanipati, G. (2019). "State of Art Review on Natural Fibers" *International Conference on Advances in Materials dan Manufacturing Engineering*, ICAMME-2018, Materials Today: Proceedings 18, 15-24.
- Singha, A.S., and Thakur, V.K. (2008). "Effect of fibre loading on urea-formaldehyde matrix based green composites," *Iranian Polymer Journal*, 17(11), 861-873.
- Sinha, A.K., Narang, H.K., and Bhattacharya, S. (2017). "Effect of alkali treatment on surface morphology of abaca fibre," *International Conference on Advancements in Aeromechanical Materials for Manufacturing (ICAAMM-2016)*. Materials Today: Proceedings, 4, 8993-8996.
- Siregar, I., Rauf, A., and Rahmawaty. (2013). "Klasifikasi sistem agroforestri berbasis salak di Kabupaten Tapanuli Selatan, Provinsi Sumatera Utara," *Jurnal Ilmu Pertanian Kultivar*, (7)1, 30-37.
- Skudric, P., Kostic, M., Medovic, A., Pejic, B., Kuraica, M., Vuskovic, A., Obradovic B., Mitrovic, D., and Puric J. (2007). "Wetting Properties of Hemp Fibres Modified by Plasma Treatment," *Journal of Natural Fibers*, 4(1), 25-33.
- Somesi, L.Y., Wildan, M.W., and Rohardjo, H.S.B. (2018). "Study on tensile properties of salak fiber (*Salacca zalacca*) reinforced CaCO<sub>3</sub>/epoxy resin hybrid composites," *Proceeding Seminar Nasional Pendidikan Teknik Otomotif, Fakultas Keguruan dan Ilmu Pendidikan*, Universitas Muhammadiyah Purworejo, 5 Mei 2018, ISSN: 2338-0284.
- Sood, M., and Dwivedi, G. (2018). "Effect of fiber treatment on flexural properties of natural fiber reinforced composites: A review," *Egyptian Journal of Petroleum*, 27(4), 775-783. <https://doi.org/10.1016/j.ejpe.2017.11.005>.
- Soraya, D.K., and Widyorini, R. (2015). "Karakteristik Papan Partikel dari Pelepah Salak Pondoh (*Salacca* sp) dengan Penambahan Asam Sitrat," *Prosiding Seminar Nasional XVIII MAPEKI 4-5 November 2015*, Bandung: 542-548.
- Sreekala, M.S., Kumaran, M.G., Joseph, S., and Jacob, M. (2000). "Oil Palm Fibre Reinforced Phenol Formaldehyde Composites: Influence of Fibre Surface Modifications on the Mechanical Performance," *Applied Composite Materials*, 7, 295-329.



- Srivaro, S., Matan, N., and Lam, F. (2018a). "Property gradients in oil palm trunk (*Elaeis guineensis*)," *Journal of Wood Science*, 64 (6), 709–719, <https://doi.org/10.1007/s10086-018-1750-8>.
- Srivaro, S., Tomad, J., Shi, J., and Cai, J. (2020). "Characterization of coconut (*Cocos nucifera*) trunk's properties and evaluation of its suitability to be used as raw material for cross laminated timber production," *Construction and building material*, 254,1-14.
- Steenis, C.G.G.J., (1975). "*Flora Untuk Sekolah di Indonesia*," Jakarta: PT. Pradnya Paramita.
- Sudo, S. (1980). "Some anatomical properties and density of the stem of coconut palm (*Cocos nucifera*), with consideration for pulp quality," *IAWA Bulletin*, 1(4), 161-172.
- Suskendriyati, H., Wjayati, A., Hidayah, N., and Cahyuning, D. (2014). "Studies on morphological and phylogenetic relationship of salak pondoh varieties (*Salacca zalacca* (Gaert.) Voss.) at Sleman highlands," *Biodiversitas*. 1(2), 59-64.
- Supapvanich, S., Megia, R., and Ding, P. (2011). "*Postharvest Biology and Technology of Tropical and Subtropical Fruits*," Volume 4: *Mangosteen to White Sapote*, Chapter 16: *Salak (Salacca zalacca (Gaertner) Voss)*, E.M. Yahie (ed.), Woodhead Publishing Limited, Philadelphia, USA.
- Sawanruji, P., Tuechart, T., Smitthipong, W., and Chollakup R. (2016). "Modification of pineapple leaf fiber surfaces with silane and isocyanate for reinforcing thermoplastic," *Journal of Thermoplastic Composite Materials*. 4(3), 455-465. DOI: 10.1177/0892705716632860
- Tamunaidu, P., and Saka, S. (2011). "Chemical characterization of various parts of nipa palm (*Nypa fruticans*)," *Industrial Crops and Products*, 34(3), 1423-1428. DOI: 10.1016/j.indcrop.2011.04.020
- Thakur, M.K., Gupta, R.K., and Thakur, V.K. (2014). "Surface modification of cellulose using silane coupling agent," *Carbohydrate Polymers*, (111), 849-855.
- Then, Y.Y., Ibrahim, N.A., Zainuddin, N., Ariffin, H., Yunus, W.M.Y.W., and Chieng, B.W. (2015). "Static mechanical, interfacial, dan water absorption behaviors of alkali treated oil palm mesocarp fiber reinforced poly (butylene succinate) biocomposites," *BioResources*, 10(1), 123-136.
- Thiruchitrambalam, M., and Shanmugam, D. (2012). "Influence of pre-treatments on the mechanical properties of palmyra palm leaf stalk fiber–polyester composites," *Journal of Reinforced Plastics dan Composites*, 31(20), 1400-1414.
- Thygesen, A., Madsen, B., Bjerre, A.B., and Lilholt, H. (2011). "Cellulosic fibers: Effect of processing on fiber bundle strength," *Journal of Natural Fibers*. 8, 161–175.
- Tjitrosoepomo, G. (1988). "Taksonomi Tumbuhan Spermatophyta," Yogyakarta: Gadjah Mada University Press.
- Tomimura, Y. (1992). "Chemical characteristics and utilization of oil palm trunks," *Japan Agricultural Research Quarterly (JARQ)*, 25 (4), 283-288.
- Tomlinson P.B., and Zimmermann. (1967). "The wood of monocotyledone," *Bulletin IAWA*.





- Tomlinson, P.B., (2006). "The uniqueness of palm," *Botanical Journal of the Linnean Society*, 151, 5–14.
- Tomlinson, P.B., Fisher, J.B., Spangler, R.E., and Richeer, R.A. (2001). "Stem vascular architecture in the rattan palm calamus (arecaceae-calamoideae-calaminiae)," *American Journal of Botany*. 88(5), 797-809.
- Tondi, G., Thevenon, M.F., Mies, B., Standfest, G., Petutschnigg, A., and Wieland, S., (2013). "Impregnation of Scots pine and beech with tannin solutions: effect of viscosity and wood anatomy in wood infiltration," *Wood Science Technology*, 47, 615–626.
- Troëdec, M.L., Rachini, A., Peyratout, C., Rossignol, S., Maxb, E., Kaftan, O., Fery, A., and Smith, A. (2011). Influence of chemical treatments on adhesion properties of hemp fibres. *Journal of Colloid and Interface Science*, 356, 303-310. doi:10.1016/j.jcis.2010.12.066.
- Uji, T. (2007). "Keanekaragaman jenis buah-buahan asli Indonesia dan potensinya" *Biodiversitas*. (8)2, 157-167.
- Umemura, K., Sugihara, O., and Kawai, S. (2013a). "Investigation of a new natural adhesive composed of citric acid and sucrose for particleboard," *Journal of Wood Science*, 59 (3), 203-208.
- Umemura, K., Sugihara, O., and Kawai, S. (2014). "Investigation of a new natural adhesive composed of citric acid and sucrose for particleboard II: effects of board density and pressing temperature," *Journal of Wood Science*, 61(1), 40-44. DOI 10.1007/s10086-014-1437-8.
- Umemura, K., Ueda, T., and Kawai, S. (2012). "Effect of moulding temperature on the physical properties of wood-based moulding bonded with citric acid" *Forest Product Journal*, 62 (1), 63-68.
- Umemura, K., Ueda, T., and Kawai, S. (2013b). "Characteristic of wood based-moulding with citric acid," *Journal of Wood Science*, 58(1), 38-45.
- Väisänen, T., Batelloa, P., Lappalaine, R., and Tomppo, L. (2018). "Modification of hemp fibers (Cannabis Sativa L.) for composite applications," *Industrial Crops and Products*, 111, 422–429. <http://dx.doi.org/10.1016/j.indcrop.2017.10.049>
- Van de Velde, K., and Kiekens, P. (1999). "Wettability of natural fibres used as reinforcement for composites," *Die Angewandte Makromolekulare Chemie*, 272, 87-93.
- Van de Velde, K., and Kiekens, P. (2000). "Wettability and surface analysis of glass fibers," *Indian Journal of fiber&textile Research*, 25, 8-13.
- Vijay, R., Singaravelu, D.L., Vinod, A., Sanjay, M.R., Siengchin, S., Jawaidd, M., Khan, A., and Parameswaranpillai, J. (2019). "Characterization of raw dan alkali treated new natural cellulosic fibers from Tridax procumbens," *International Journal of Biological Macromolecules*, 125, 99-108. <https://doi.org/10.1016/j.ijbiomac.2018.12.056>.
- Wahab, R., Mohamed, A., Mustafa, M. T., and Hasan, A. (2009). "Physical Characteristic and anatomical properties of cultivated bamboo (*Bambusa vulgaris* Schrad.) culms," *Journal of Biological Science*, 9(7), 753-759.
- Walther, T., Kartal, S.N., Hwang, W.J., Umemura, K., and Kawai, S. (2007). "Strenght, decay, and termite resistance of oriented kenaf fiberboard." *Journal of Wood Science*, 53, 481-486.





- Wang, D., and Sun. X.S. (2002). "Low density particleboard from wheat straw and corn pith," *Industrial Crops and Product*, 15, 43-50.
- Wang, H. M., Postle, R., Kessler, R. W., and Kessler, W. (2003). Removing Pectin dan Lignin During Chemical Processing of Hemp for Textile Applications. *Textile Research Journal*, 73(8), 664-669. <https://doi.org/10.1177/004051750307300802>.
- Wang, N., Liua, W., Huang, J., and Ma, K. (2014). "The structure-mechanical relationship of palm vascular tissue," *Journal of the Mechanical Behavior of Biomedical Materials*, 36, 1-11.
- Wang, Y., Zhan, H., Ding, Y., Wang, S., and Lin, S. (2016). "Variability of anatomical and chemical properties with age and height in *Dendrocalamus brandisii*," *BioResources*, 11(1), 1202-1213.
- Wanga, N., Liua, W., Huang, J., and Ma, K. (2014). "The structure-mechanical relationship of palm vascular tissue," *Journal of the Mechanical Behavior of Biomedical Materials*, 36, 1-11.
- Wardhani, I.Y., Surjokusumo, S., Hadi, Y.S and Nugroho, N. (2004). "Distribution of Chemical Compounds of Coconut Wood (*Cocos nucifera* L)," *Jurnal Ilmu dan Teknologi Kayu Tropis*, 2(1), 1-7.
- Wen, M-Y., Kang, C-W., and Park, H-J. (2014). "Impregnation and mechanical properties of three softwoods treated with a new fire retardant chemical," *Journal of Wood Science* 60, 367-375.
- Widyorini, R., Nugraha, P.A., Rahman, M.Z.A., and Prayitno, T.A. (2016b). "Bonding Ability of a New Adhesive Composed of Citric Acid-Sucrose for Particleboard," *BioResources*, 11(2), 4526-4535.
- Widyorini, R., Umemura, K., Isnani, R., Putra, D.R., Awaluddin, A., and Prayitno, T.A. (2016a). "Manufacturing and properties of citric acid-bonded particleboard made from bamboo materials" *European Journal of Wood and Wood Product*, 74, 57-65.
- Widyorini, R., Umemura, K., Septiano, A., Soraya, D. K., Dewi, G. K., and Nugroho, W. D. (2018). "Manufacture and properties of citric acid-bonded composite board made from Salacca frond: Effects of maltodextrin addition, pressing temperature, and pressing method," *BioResources*, 13(4), 8662-8676. DOI: 10.15376/biores.13.4.8662-8676.
- Widyorini, R., Umemura, K., Soraya, D. K., Dewi, G. K., and Nugroho, W. D. (2019). "Effect of citric acid content and extractives treatment on the manufacturing process and properties of citric acid-bonded salacca frond particleboard," *BioResources*, 14(2), 4171-4180. DOI: 10.15376/biores.14.2.4171-4180.
- Wiryo, Puteri, V.N.U., and Senoaji G. (2016). "The diversity of plant species, the types of plant use and the estimate of carbon stock in agroforestry system in Harapan Makmur Village, Bengkulu, Indonesia," *Biodiversitas*, (17)1, 249-255.
- Xie, J., Qi, J., Hu, T., Hoop, C.F.D., Hse, C.Y., and Shupe, T.F. (2016). "Effect of fabricated density and bamboo species on physical-mechanical properties of bamboo fiber bundle reinforced composites," *Journal of Materials Science*, 51, 7480-7490.



- Yildiz, S and Gumuskaya, E. (2007). "The effect of thermal modification on crystalline structure of cellulose in soft and hardwood," *Building and environment*, 47, 62-67. <https://doi.org/10.1016/j.buildenv.2005.07.009>.
- Yu, H., Cao, Y., Fang, Q., and Liu, Z. (2015). "Effects of Treatment Temperature on Properties of Starch-based Adhesives," *BioResources*, 10(2): 3520-3530.
- Yudha, V., Rochardjo, H.S.B., Jamasri, J., Widyorini, R., Yudhanto, F., and Darmanto, S. (2018). "Isolation of cellulose from salacca midrib fibers by chemical treatments," *3rd Annual Applied Science dan Engineering Conference (AASEC 2018). IOP Conf. Series: Materials Science dan Engineering*: 012078 doi:10.1088/1757-899X/434/1/012078.
- Zhai, S., Imai, T., Horikawa, Y., and Sugiyama, J. (2013). "Anatomical and mechanical characteristics of leaf-sheath *fibrovascular bundles* in palms," *IAWA Journal*, 34(3), 285-300. DOI: 10.1163/22941932-00000024
- Zhai, S., Li, D., Pan, B., Sugiyama, J., and Itoh, T. (2012). "Tensile strength of windmill palm (*Trachycarpus fortunei*) fiber bundles and its structural implications," *Journal of Materials Science*, 47(2), 949-959. DOI: 10.1007/s10853-011-5874-0
- Zhang, G., Huang, K., Jiang, X., Huang, D., and Yang, Y. (2013). "Acetylation of Rice Straw for Thermoplastic application," *Carbohydrate Polymers*, 96, 218-226.
- Zhao, Z., and Umemura, K. (2014), "Investigation of a new natural particleboard adhesive composed of tannin and sucrose," *Journal of Wood Science*, 60, 269-277. DOI 10.1007/s10086-014-1405-3.
- Zhao, Z., Umemura, K., and Kanayama, K. (2016). "Effect of the addition of citric acid on tannin-sucrose adhesive and physical properties of the particleboard," *BioResources*, 11(1), 1319-1333.
- Zhou, Y., Fan, M., and Chen, L. (2016). "Interface dan bonding mechanisms of plant fibre composites: An overview." *Composites-Part B*, 101, 31-45, <http://dx.doi.org/10.1016/j.compositesb.2016.06.055>.
- Zimmermann, M. H., and Tomlinson, P. B. (1972). "The vascular system of monocotyledonous stems," *Botanical Gazette*, 133(2), 141-155.
- Zini, E., and Scandola, M., (2011). "Green Composites: an overview," *Polymer Composites*, (32), 1905-1915.
- Zumaidar, Chikmawati, T., Hartana, A., Sobir, Moge, J. P., and Borchsenius, F. (2014). "*Salacca acehensis* (Arecaceae), a new species from Sumatra, Indonesia," *Phytotaxa*, 159(4), 287-290. DOI: 10.11646/phytotaxa.159.4.5.