

DAFTAR PUSTAKA

- A.L.C.A., 1954. Method for the analysis of vegetable tanning materials. JALCA 49.3.
- Anon, 1965. Official Method of Analysis. Published by the Society of Leather Trades. Chemists. Four Revised Edition Redbown, Haerts, England.
- Andianto, A., 2011. Perbandingan Ciri Anatomi Kayu Dan Kulit 3 Jenis Pulai. *Jurnal Penelitian Hasil Hutan* 29, 356–368. <https://doi.org/10.20886/jphh.2011.29.4.356-368>
- Ardiansjah, Y., Suciati, N., Herumurti, D., 2012. Pengenalan Spesies Tanaman Berdasarkan Bentuk Daun Menggunakan Metode Klasifikasi Move Median Center (Mmc) *Hypersphere* 1–7.
- Arianti, D.C., 2011. Akasia (*Acacia mangium* Willd) Terhadap Kualitas Papan Partikel Yang Dihasilkannya. Departemen Hasil Hutan Fakultas Kehutanan Institut Pertanian Bogor 60.
- Bacardit, A., Baquero, G., Sorolla, S., Ollé, L., 2015. Evaluation of a new sustainable continuous system for processing bovine leather. *Journal of Cleaner Production* 101, 197–204. <https://doi.org/10.1016/j.jclepro.2015.04.012>
- Ballard, R., 2001. Manufacturing Sectors Studi A Preliminary Study on the Bovine Leather Value Chain in South Africa, Development.
- Barr, C., 2007. Hutan Tanaman Dikelola Intensif di Indonesia: Tinjauan Tren Terkini dan Rencana Terbaru. Center for International Forestry Research (CIFOR) 30.
- Basaran, B., Sancaklı, A., Dilek, Y., 2015. Improving The Properties of Wet-White Tanned Leather Characteristics By Using Collagen-Based Biopolymer 10.
- Boissiere, M., Garde, V.L., Izquierdo, E., Boissi, M., Robinet, L., 2013. Characterization Of The Effect Of Heat Characterization Of The Effect Of Heat On Vegetable Tanned Leather.
- Budisatria, I.G.S., 2009. Goat Germplasm in Indonesia. Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.
- Carşote, C., Badea, E., Miu, L., Gatta, G. Della, 2016. Study of the effect of tannins and animal species on the thermal stability of vegetable leather by differential scanning calorimetry. *Journal of Thermal Analysis and Calorimetry* 124, 1255–1266. <https://doi.org/10.1007/s10973-016-5344-7>
- Covington, A.D., 1997. *Modern Tanning Chemistry*, revisi 26. ed.
- Fahidin, Muslich, 1999. *Ilmu dan Teknologi Kulit*. Institut Pertanian Bogor, Bogor.
- Falcão, L., Araújo, M.E.M., 2013. Tannins characterization in historic leathers by complementary analytical techniques ATR-FTIR, UV-Vis and chemical tests. *Journal of Cultural Heritage* 14, 499–508. <https://doi.org/10.1016/j.culher.2012.11.003>
- Fauziyah, A.N., Sunaryo, A.E., Hadi, A.H., Saputra, F.A., 2016. Klasifikasi Kualitas Kulit Sapi Menggunakan Fuzzy Inference 1–8.
- Fauziyah, A.N., Sunaryo, A.E., Hadi, A.H., Saputra, F.A., 2015. Klasifikasi Kualitas Kulit Sapi Menggunakan Fuzzy Inference. Fakultas Ilmu Komputer, Universitas Brawijaya 1–8.
- Fengel, D., Wegener, G., 1983. *Kimia Kayu*. Terjemahan H. Sastroamidjojo. Gadjah Mada University Press.

- Gao, D., 2019. A green chemistry approach to leather tanning process: Cage-like octa(aminosilsesquioxane) combined with Tetrakis(hydroxymethyl)phosphonium sulfate. *Journal of Cleaner Production* 10.
- Grasel, F. dos S., Ferrão, M.F., Wolf, C.R., 2016. Ultraviolet spectroscopy and chemometrics for the identification of vegetable tannins. *Industrial Crops and Products* 91, 279–285. <https://doi.org/10.1016/j.indcrop.2016.07.022>
- Gusti, D.R., Farid, F., 2013. Ekstrak Kulit Kayu Akasia Sebagai Inhibitor pada Laju Korosi Baja Lunak dalam Media Asam Sulfat 4.
- Haroun, M., Khirstova, P., Abdallah, G., Tony, C., 2008. Vegetable and aluminium combination tannage: a boon alternative to chromium in the leather industry. *Suranaree journal of science and technology* 15, 123–132.
- Haroun, M., Khirstova, P., Covington, T., 2013. Analysis of Commercial Vegetable Tannin materials and Related Polyphenols of Selected Acacia Species in Sudan. *Journal of forest Product & Product* 2, 21–28.
- Hedberg, Y.S., Lidén, C., Odnevall Wallinder, I., 2014. Correlation between bulk- and surface chemistry of Cr-tanned leather and the release of Cr(III) and Cr(VI). *Journal of Hazardous Materials* 280, 654–661. <https://doi.org/10.1016/j.jhazmat.2014.08.061>
- Herminiwati, H., Waskito, S., Purwanti, C.M.H., Prayitno, P., Ningsih, D., 2015a. Pembuatan bahan penyamak nano nabati dan aplikasinya dalam penyamakan kulit. *MKKP* 31, 15. <https://doi.org/10.20543/mkkp.v31i1.180>
- Herminiwati, H., Waskito, S., Purwanti, C.M.H., Prayitno, P., Ningsih, D., 2015b. Manufacturing of nano vegetable tanning materials and application in leather tanning. *Majalah Kulit, Karet, dan Plastik* 31, 15–22. <https://doi.org/10.20543/mkkp.v31i1.180>
- Hussain, G., Abass, N., Shabir, G., Athar, M., Saeed, A., Saleem, R., Ali, F., Khan, M.A., 2017. New acid dyes and their metal complexes based on substituted phenols for leather: Synthesis, characterization and optical studies. *Journal of Applied Research and Technology* 15, 346–355. <https://doi.org/10.1016/j.jart.2017.03.002>
- Hussein, S.A., 2017. Utilization of Tannins Extract of Acacia seyal Bark (Taleh) in Tannage of Leather. *J Chem Eng Process Technol* 08. <https://doi.org/10.4172/2157-7048.1000334>
- Ibrahim, L., Juliyarsi, I., Melya, S., 2005. Ilmu dan Teknologi Pengolahan Kulit. Fakultas Peternakan Universitas Andalas, Padang.
- Iriany, Pandiangan, Eka, &, 2017. Extraction of tanin from Acacia bark using microwave: impact of power of microwave, extraction time and solvent. *Jurnal Teknik Kimia USU*, Vol. 6, No. 3 6, 52–57.
- Kasim, A., Asben, A., Mutiar, S., 2018. Easy Ways to Tanning Process of Goat Skin (Cara Mudah Menyamak Kulit Kambing). *ANDI (Anggota IKAPI)*.
- Kasim, A., Asben, A., Mutiar, S., 2015. Kajian Kualitas gambir dan hubungannya dengan karakteristik kulit tersamak. *Majalah Kulit, Karet dan Plastik*. Vol. 31. No.1.
- Kasim, A., Mutiar, S., 2016. Penyamakan kulit kambing untuk memperoleh kulit tersamak berkekuatan tarik tinggi melalui penyamakan kombinasi. *Prosiding, Balai Besar Penyamakan Kulit Karet dan Plastik*.

- Kasim, A., Novia, D., Mutiar, S., Efendi, A., 2014. Diminishing chromium use on combined chromium- gambier tanning process upon the characteristics of tanned leather. *Media Peternakan*. Vol. 37, No. 1.
- Kasim, A., Novia, D., Mutiar, S., Efendi, A., 2014. Diminishing Chromium Use on Combined Chromium-Gambier Tanning Process Upon the Characteristics of Tanned Leather. *Med Pet* 37, 24–29. <https://doi.org/10.5398/medpet.2014.37.1.24>
- Kasim, A., Novia, D., Mutiar, S., Pinem, J., 2013a. Karakterisasi kulit kambing pada persiapan penyamakan dengan gambir dan sifat kulit tersamak yang dihasilkan. *MKKP* 29, 1. <https://doi.org/10.20543/mkcp.v29i1.213>
- Kasim, A., Novia, D., Mutiar, S., Pinem, J., 2013b. Karakterisasi kulit kambing pada persiapan penyamak dengan gambir dan sifat kulit tersamak yang dihasilkan. *Majalah Kulit, Karet dan Plastik*. Vol. 29. No. 1.
- Kasim, Anwar., Nurdin, H., Mutiar, S., 2012. Aplikasi gambir sebagai bahan penyamak kulit melalui penerapan penyamakan kombinasi. *Jurnal Litbang Industri*. Vol. 2, No.2. 2, 55–62.
- Kasmudjiastuti, E., 2014a. Characterization Of Tingi (Ceriops tagal) Bark As Vegetable Tanning Material. *MKKP* 30, 71–78. <https://doi.org/10.20543/mkcp.v30i2.128>
- Kasmudjiastuti, E., 2014b. Karakterisasi Kulit Kayu Tingi (Ceriops tagal) Sebagai Bahan Penyamak Nabati. *Majalah Kulit, Karet, dan Plastik* 30, 71–78. [https://doi.org/FTIR spectrum, procyanidin, tingi bark, tannin, solution absorption](https://doi.org/FTIR_spectrum,_procyanidin,_tingi_bark,_tannin,_solution_absorption)
- Kusuma, A., Punomoadi, A., Al Baari, A.N., 2013. Comparison of the percentage of skin between the Kejobong goat, Ettawah crossbreed goat and one year old male goat. *Animal Agriculture Jurnal* 2, 114–119.
- Lembang, M., 2017. Basic properties and uses of agathis (*Agathis hamii* M. Dr.) wood from South Sulawesi. *Jurnal Penelitian Kehutanan Wallacea* 6, 157–167. <https://doi.org/10.18330/jwallacea.2017.vol6iss2pp157-167>
- Liao, J., Qu, B., Liu, D., Zheng, N., 2015a. New method to enhance the extraction yield of rutin from *Sophora japonica* using a novel ultrasonic extraction system by determining optimum ultrasonic frequency. *Ultrasonics Sonochemistry* 27, 110–116. <https://doi.org/10.1016/j.ultsonch.2015.05.005>
- Liao, J., Qu, B., Liu, D., Zheng, Naiqin, &, 2015b. Ultrasonics Sonochemistry New method to enhance the extraction yield of rutin from *Sophora japonica* using a novel ultrasonic extraction system by determining optimum ultrasonic frequency. *Ultrasonics Sonochemistry* 27, 110–116. <https://doi.org/10.1016/j.ultsonch.2015.05.005>
- Lisnawati, Y., Suprijo, H., Poedjirahajoe, E., Batu, J.G., Kehutanan, F., Mada, U.G., Agro, J., 2015. The Impact of Development of Industrial Plantation Forest *Acacia crassicarpa* in Peatland Towards the Maturity Lev 22, 179–186.
- Listyanto, T., 2016. *Teknologi Pengeringan kayu dan Aplikasinya di Indonesia*. Gadjah mada University Press. Yogyakarta.
- Lokeswari, N., Sujatha, P., 2011. Isolation Of Tannins From *Caesalpinia Coriaria* And Effect Of Physical Parameters. *IJRP* 2, 146–152.

- Lubis, E.H., Wijaya, H., Lestari, N., 2012. Study of Extraction and stability of carotenoid total α and β cryptoxanthin in buah merah extract. *Jurnal Riset teknologi Industri* 6, 39–53.
- Maier, M., Oelbermann, A.L., Renner, M., Weidner, E., 2017. Screening of European medicinal herbs on their tannin content—New potential tanning agents for the leather industry. *Industrial Crops and Products* 99, 19–26. <https://doi.org/10.1016/j.indcrop.2017.01.033>
- Marisa, Ermawati, Alwai, W., 2017. Application of Fuzzy Inference System (Fis) Sugeno Method in Decision Support Systems (Spk) to determine the amount of goods production based on inventory data and the amount of demand. *Jurnal MSA Vol. 5 No. 2 P.1-13*.
- Martawijaya, A., Kartasujana, I., Kadir, K., Prawira, S.A., 1989. Atlas Kayu Indonesia. jilid I, Pusat Penelitian dan Pengembangan Kehutanan.
- Mekonnen, D., Habtanun, S., Sathiyamoorthy, M., Selvi, V., 2013. Preparation of eco-friendly leather by process modifications to make pollution free tanneries. *Journal of Engineering Computers & Applied Sciences* 2(5), 17–22.
- Mello, Beatriz, C.B.S., Kakuda, Paula, M., 2006. Influence of pH variation during propolis extraction with the use of water as solvent. Dept. of Food Engineering, Faculty of Food Engineering, University of Campinas, Brazil.
- Missio, A.L., Tischer, B., dos Santos, P.S.B., Codevilla, C., de Menezes, C.R., Barin, J.S., Haselein, C.R., Labidi, J., Gatto, D.A., Petutschnigg, A., Tondi, G., 2017a. Analytical characterization of purified mimosa (*Acacia mearnsii*) industrial tannin extract: Single and sequential fractionation. *Separation and Purification Technology* 186, 218–225. <https://doi.org/10.1016/j.seppur.2017.06.010>
- Missio, A.L., Tischer, B., dos Santos, P.S.B., Codevilla, C., de Menezes, C.R., Barin, J.S., Haselein, C.R., Labidi, J., Gatto, D.A., Petutschnigg, A., Tondi, G., 2017b. Analytical characterization of purified mimosa (*Acacia mearnsii*) industrial tannin extract: Single and sequential fractionation. *Separation and Purification Technology* 186, 218–225. <https://doi.org/10.1016/j.seppur.2017.06.010>
- Mukhriani, 2014. Ekstraksi, pemisahan senyawa, dan identifikasi senyawa aktif. *Jurnal Kesehatan VII*, 361–367.
- Mulyarto, A.R., Safera, dan W., 2007. Determination of an Optimum Extraction Time and Its Production Cost of Powdered Extract of Guava (*Psidium guajava*) Leaf. *Jurnal Teknologi Pertanian* 8, 88–94.
- Mustakim, Aris, SW., Kurniawan, A.P., 2010. Perbedaan kualitas kulit kambing peranakan etawa (PE) dan peranakan boor (PB) yang disamak krom. *Jurnal Ternak Tropika* 11, 38.50. <https://doi.org/10.1017/CBO9781107415324.004>
- Mustakim, S., Aris, W., Kurniawan, A., 2010. Perbedaan Kualitas Kulit Kambing Peranakan Etawa (PE) dan Peranakan Boor (PB) yang Disamak Krom. *Jurnal Ternak Tropika Vol. 11 No. 1. Fakultas Perternakan Universitas Brawijaya*.
- Mutiar, S., Kasim, A., Emriadi, E., Asben, A., 2019. Studi awal tanin dari kulit kayu *Acacia auriculiformis* A. Cunn. ex Benth. dari hutan tanaman industri untuk

- bahan penyamak kulit. MKKP 34, 41.
<https://doi.org/10.20543/mkkp.v34i2.3967>
- Nasir, S., Kamila, H., 2009. Ekstraksi Dedak Padi Menjadi Minyak Mentah Dedak Padi (Crude Rice Bran Oil) Dengan Pelarut N-Hexane Dan Ethanol 16, 10.
- Pandit, I.K.N., Kurniawan, D., 2008. Anatomi Kayu: Struktur Kayu, Kayu Sebagai Bahan Baku dan Ciri Diagnostik Kayu Perdagangan Indonesia. Fakultas Kehutanan. Institut Pertanian Bogor.
- Pizzi, A., 1983. *Methods of Wood Chemistry*. Interscience Publishers. New York, 1(2).
- (PPP), P.P.P., 2011. Jenis Bahan Penyamak. Pusat Pengembangan Pendidikan (PPP) UGM, 11–20.
- Prasannena, T.W., Hartatie, E.S., Pancapalaga, W., 2018. Pengaruh konsentrasi mimosa terhadap kadar lemak dan kekuatan tarik kulit kelinci samak. *Journal of Animal Research Applied Sciences* 24–29.
- Pratini, C.E., 2017. Ekstraksi Tanin dari Kulit Kayu Pinus dengan Bantuan Microwave: Pengaruh Daya Microwave, Jenis Pelarut dan Waktu ekstraksi. *JIP UNTIRTA* 6, 155. <https://doi.org/10.36055/jip.v6i4.2429>
- Purnomo, E., 1991. *Penyamaka Kulit Reptil*. Akademi Teknologi Kulit, Yogyakarta.
- Rachmawati, O., Sugita, P., Santoso, A., 2018. Sintesis Perekat Tanin Resorsinol Formaldehida dari Ekstrak Kulit Pohon Mangium untuk Peningkatan Kualitas Batang Sawit. *Jurnal Penelitian Hasil Hutan* 36, 33–46.
- Rahmadhani, R.A., Riyadi, D.H.S., Triwibowo, B., Kusumaningtyas, R.D., 2017. Review pemanfaatan design expert untuk optimasi komposisi campuran minyak nabati sebagai bahan baku sintesis biodisel. *jurnal Teknik Kimia dan Lingkungan* 1, 11–16.
- Rema, T., Parivallal, B., Ramanujam, R.A., 2010. Studies on Degradation of Syntan used in Leather Tanning Process using Ozone. *International Journal of Environmental Science and Development* 1, 264–267. <https://doi.org/10.7763/IJESD.2010.V1.51>
- Rhazi, N., Hannache, H., Oumam, M., Sesbou, A., Charrier, B., Pizzi, A., Charrier-El Bouhtoury, F., 2015. Green extraction process of tannins obtained from Moroccan *Acacia mollissima* barks by microwave: Modeling and optimization of the process using the response surface methodology RSM. *Arabian Journal of Chemistry* 1–17. <https://doi.org/10.1016/j.arabjc.2015.04.032>
- Rhazi, N., Hannache, H., Oumam, M., Sesbou, A., Charrier, B., Pizzi, A., Charrier-El Bouhtoury, F., 2014. Green extraction process of tannins obtained from Moroccan *Acacia mollissima* barks by microwave: Modeling and optimization of the process using the response surface methodology RSM. *Arabian Journal of Chemistry*. <https://doi.org/10.1016/j.arabjc.2015.04.032>
- Rismawati, S.N., Ismiyati, I., 2017. Pengaruh Variasi pH Terhadap Kadar Flavonoid Pada Ekstraksi Propolis Dan Karakteristiknya Sebagai Antimikroba. *KONVERSI* 6, 89. <https://doi.org/10.24853/konversi.6.2.89-94>
- Rotinsulu, M.D., Inal, H., Kalele, J.A.D., Tangkere, E., 2015. Pengamatan Post-Mortem Kualitas Kulit Kambing di Kota Manado 2, 7.

- Said, M.I., 2012. Ilmu dan Teknologi Pengolahan Kulit. Fakultas Peternakan, Universitas Hasanuddin, Makasar.
- Saien, J., Daneshamoz, S., 2018. Ultrasonics - Sonochemistry Experimental studies on the effect of ultrasonic waves on single drop liquid – liquid extraction. *Ultrasonics - Sonochemistry* 40, 11–16. <https://doi.org/10.1016/j.ultsonch.2017.06.020>
- Santoso, A., Abdurachman, A., 2016. Karakteristik Ekstrak Kulit Kayu Mahoni Sebagai Bahan Perekat Kayu. *Jurnal Penelitian Hasil Hutan* 34, 269–284.
- Setiawan, A., Yanto, B., Yasdomi, K., 2018. Logika Fuzzy dengan Matlab (Contoh Kasus Penelitian Penyakit Bayi dengan Fuzzy Tsukamoto). Jayapangus Press. Bali 102.
- Shi, J., Puig, R., Sang, J., Lin, W., 2016. A comprehensive evaluation of physical and environmental performances for wet-white leather manufacture. *Journal of Cleaner Production* 139, 1512–1519. <https://doi.org/10.1016/j.jclepro.2016.08.120>
- Sjostrom, E., 1981. Kimia Kayu: Dasar-Dasar dan Penggunaan. Ed ke-2. Hardjono Sastrohamidjojo, penerjemah; Yogyakarta: FMIPA Universitas Gajahmada. Terjemahan dari: Wood Chemistry.
- Suardana, I., Sudiyadnyana, M., Rubyyanto, 2008. Kriya kulit jilid I. Direktorat Pembinaan Sekolah Menengah Kejuruan, Jakarta.
- Suparno, O., 2005. Teknologi Baru Penyamakan Kulit Ramah Lingkungan: Penyamakan Kombinasi Menggunakan Penyamak Nabati, Naftol dan Oksazolidin 18, 1988.
- Suparno, O., Covington, A.D., Evans, C.S., 2008. New Environmentally Benign Leather Technology: Combination Tanning Using Vegetable Tannin, Naphthol And Oxazolidine. *J Tek. Ind. Pert.* Vol. 18(2), 79-84 1.
- Suprapti, S., Santoso, E., Djarwanto, D., Turjaman, M., 2012. Pemanfaatan Kompos Kulit Kayu Mangium Untuk Media Pertumbuhan Cendawan Mikoriza Arbuskula Dan Bibit. *Jurnal Penelitian Hasil Hutan* 30, 114–123. <https://doi.org/10.20886/jphh.2012.30.2.114-123>
- Sutyasmi, S., 2017. Efektivitas penggunaan gambir sebagai bahan penyamak nabati sistem C-RFP untuk pembuatan kulit jaket dari kulit domba. *MKKP* 33, 11. <https://doi.org/10.20543/mkkp.v33i1.1619>
- Suytasmi, S., 2015. Physical, Chemical, And Morphological Properties Of Tanned Goat Jacket Leather Using Recovered Chrome From Tanning Waste Water. *MKKP* 31, 107–114. <https://doi.org/10.20543/mkkp.v31i2.176>
- TAPPI, 1989. TAPPI Standards : Regulations and Style Guidelines. Atlanta: TAPPI Press.
- Triatmojo, S., 2012. Teknologi Pengolahan Kulit Sapi.
- Veggi, Priscilla, C., Martinez, J., Angela, A., Meireles, A., 2013. Microwave-assisted Extraction for Bioactive Compounds Theory and Practice, in: Food Engineering Series. Springer New York Heidelberg Dordrecht London.
- Vyskočilová, G., Ebersbach, M., Kopecká, R., Prokeš, L., Příhoda, J., 2019. Model study of the leather degradation by oxidation and hydrolysis. *Herit Sci* 7, 26. <https://doi.org/10.1186/s40494-019-0269-7>
- Wijoseno, R., Astiti, L.G.S., Panjaitan, T., Muzani, A., Ayustita, N., 2009. Beternak Kambing Intensif. Balai pengkajian Teknologi Pertanian. NTB.

- Wina, E., Susana, I.W.R., Tangendjaja, B., 2008. Biological activity of tanins from *Acacia mangium* bark extracted by different Solvents. *Media Peternakan* 33, 103–107.
- Yanti, H., Syafii, W., Darma, I.T., 2008. Sifat Anti Rayap Zat Ekstraktif Kulit Kayu *Acacia auriculiformis* A. Cunn. ex Benth. 57.
- Yazaki, Y., Hillis, W.E., 1977. Polyphenolic extractive of *Pinus radiata* bark. *Holzforschung* 31, 20–25.
- Yudi, 2009. Pemeriksaan Ante-PostMortem.
- Yudiono, K., 2011. Ekstraksi Antosianin Dari Ubijalar Ungu. *Jurnal Teknologi Pangan* 2, 30.
- Zakir, M.J., Ramalingam, S., Balasubramanian, P., Rathinam, A., Sreeram, K.J., Rao, J.R., Nair, B.U., 2015. Innovative material from paper and pulp industry for leather processing. *Journal of Cleaner Production* 104, 436–444. <https://doi.org/10.1016/j.jclepro.2015.05.001>



