

## DAFTAR PUSTAKA

- Abdullah, F., Sijam, K., Omar, D., & Rashid, T. S. (2021). *Antifungal activity of Piper aduncum leaf extracts against Rigidoporus microporus, the white root rot pathogen of rubber tree*. *Journal of Phytopathology*, 169(11-12), 690-701. <https://doi.org/10.1111/jph.13045>.
- Akthar, M. S., Birhanu, G., & Demisse, S. (2014). Antimicrobial activity of *Piper nigrum* L. and *Cassia didymobotyra* L. leaf extract on selected food borne pathogens. *Asian Pacific Journal of Tropical Disease*, 4(S2), S911–S919. [https://doi.org/10.1016/S2222-1808\(14\)60757-X](https://doi.org/10.1016/S2222-1808(14)60757-X).
- Ali, S., Coombes, R.C. (2021). Estrogen receptor alpha in human breast cancer: occurrence and significance. *J Mammary Gland Biol Neoplasia*, 26, 13–23.
- Almeida, R. N., Navarro, D. S., & Barbosa, J. M. (2009). Atividade larvicida de óleos essenciais contra *Aedes aegypti* L. (Diptera: Culicidae). *Neotropical Entomology*, 38(6), 828–833.
- Aligiannis, N., Kalpoutzakis, E., Mitaku, S., & Chinou, I. B. (2001). Composition and antimicrobial activity of the essential oils of two *Origanum* species. *Journal of Agricultural and Food Chemistry*, 49(9), 4168–4170.
- Arif, T., Bhosale, J. D., Kumar, N., Mandal, T. K., Bendre, R. S., Lavekar, G. S., & Dabur, R. (2009). Natural products–antifungal agents derived from plants. *Journal of Asian Natural Products Research*, 11(7), 621–638.
- Ayoola, G., Coker, H., Adesegun, S., Adepoju-Bello, A., Obaweya, K., Ezennia, E., & Atangbayila, T. (2008). Phytochemical Screening and Antioxidant Activities of Some Selected Medicinal Plants Used for Malaria Therapy in Southwestern Nigeria. *Tropical Journal of Pharmaceutical Research*, 7(3), 1019–1024. <https://doi.org/10.4314/tjpr.v7i3.14686>.
- Azaldin, M. F., Rahman, M. A., & Ahmed, M. U. (2021). Root diseases in rubber plantations: Impact and management strategies. *Journal of Rubber Research*, 24(2), 85–102.
- Bezerra, D. P., Pessoa, C., de Moraes, M. O., Saker-Neto, N., Silveira, E. R., & Costa-Lotufo, L. V. (2013). Overview of the therapeutic potential of pipilartine (piperlongumine). *European Journal of Pharmaceutical Sciences*, 48(3), 453–463.

- Bezerra, D. P., Pessoa, C., de Moraes, M. O., Saker-Neto, N., Silveira, E. R., & Costa-Lotufo, L. V. (2020). Overview of the therapeutic potential of piperlongumine (piperlongumine). *European Journal of Pharmaceutical Sciences*, *153*, 105493.
- Bills, G. F., Platas, G., & Peláez, F. (2000). Antifungal activity of natural and synthetic tetrahydroxylated triterpenoids. *Journal of Antibiotics*, *53*(7), 687–695.
- Borges, D. F., Lopes, E. A., Moraes, A. R. F., Soares, M. S., Visôto, L. E., Oliveira, C. R., & Valente, V. M. M. (2022). Formulation of botanicals for the control of plant pathogens: A review. *Crop Protection*, *151*, 105821.
- Bussaman, P., Namsena, P., Rattanasena, P., & Chandrapatya, A. (2012). Effect of crude leaf extracts on *Colletotrichum gloeosporioides* (Penz.) Sacc. *Psyche*, *2012*, Article ID 309046. <https://doi.org/10.1155/2012/309046>.
- Chanprapai, P., & Chavasiri, W. (2017). Antimicrobial activity from *Piper sarmentosum* Roxb. against rice pathogenic bacteria and fungi. *Journal of Integrative Agriculture*, *16*(11), 2513–2524. [https://doi.org/10.1016/S2095-3119\(17\)61693-9](https://doi.org/10.1016/S2095-3119(17)61693-9).
- Chen, Y., Li, W., & Wang, J. (2022). Metabolomic analysis reveals antifungal compounds in *Piper betle* against *Colletotrichum gloeosporioides*. *Industrial Crops and Products*, *177*, 114456. <https://doi.org/10.1016/j.indcrop.2021.114456>.
- Chen, Y., & Wang, H. (2020). Antifungal activity of *Piper aduncum* essential oil and its mode of action against *Colletotrichum gloeosporioides*. *Pesticide Biochemistry and Physiology*, *168*, 104643.
- Chen, Y., Wang, J., Yang, N., Wen, Z., Sun, X., Chai, Y., & Ma, Z. (2019). Fitness and competitive ability of *Botrytis cinerea* isolates with resistance to multiple chemical classes of fungicides. *Phytopathology*, *109*(10), 1709–1719.
- Cheng, M. J., Lee, S. J., Chang, Y. Y., Wu, S. H., Tsai, I. L., Jayaprakasam, B., & Chen, I. S. (2003). Chemical and cytotoxic constituents from *Peperomia sui*. *Phytochemistry*, *63*(5), 603–608. [https://doi.org/10.1016/S0031-9422\(03\)00183-3](https://doi.org/10.1016/S0031-9422(03)00183-3).
- Chiang, K., Liu, H., & Bock, C. H. (2017). A discussion on disease severity index values: warning on inherent errors and suggestions to maximize accuracy. *Annals of Applied Biology*, *171*(2), 139–154. <https://doi.org/10.1111/aab.12362>.
- Dabur, R., Gupta, A., Mandal, T. K., Singh, D. D., Bajpai, V., Gurav, A. M., & Lavekar, G. S. (2005). Antimicrobial activity of some Indian medicinal plants. *African Journal of Traditional, Complementary and Alternative Medicines*, *4*(3), 313–318.

- Da Silva, H. A., Yamaguchi, L. F., Young, M. C. M., Ramos, C. S., Amorim, A. M. A., Kato, M. J., & Batista, R. (2018). Antifungal piperamides from *Piper mollicomum* Kunth (Piperaceae). *Eclética Química*, 43(1), 33–38. <https://doi.org/10.26850/1678-4618eqj.v43.1.33-38>.
- Da Silva, J. K. R., Pinto, L. C., Burbano, R. M. R., Montenegro, R. C., Andrade, E. H. A., & Maia, J. G. S. (2016). Composition and cytotoxic and antioxidant activities of the oil of *Piper aequale* Vahl. *Lipids in Health and Disease*, 15(1), 1–6. <https://doi.org/10.1186/s12944-016-0347-8>.
- da Silva, J. K. R., Pinto, L. C., Burbano, R. M. R., Montenegro, R. C., Guimarães, E. F., Andrade, E. H. A., & Maia, J. G. S. (2014). Essential oils of Amazon *Piper* species and their cytotoxic, antifungal, antioxidant and anticholinesterase activities. *Industrial Crops and Products*, 58, 55–60. <https://doi.org/10.1016/j.indcrop.2014.04.006>.
- Darmono, T. W., & Suhendra, D. (2020). Penyakit penting pada tanaman karet (*Hevea brasiliensis*) di Indonesia dan strategi pengendaliannya. *Jurnal Fitopatologi Indonesia*, 16(6), 207–219.
- de Almeida, G. C., Oliveira, L. F. G., Predes, D., Fokoue, H. H., Kuster, R. M., Oliveira, F. L., & Zancan, P. (2020). Antiproliferative activity of *Piper tuberculatum* Jacq. fruit extract and its main constituent, pipartine, in prostate cancer cells. *Journal of Ethnopharmacology*, 252, 112580.
- Dissanayake, A. J., Phillips, A. J. L., Li, X. H., & Hyde, K. D. (2020). Botryosphaeriaceae: Current status of genera and species. *Mycosphere*, 7(8), 1001–1073.
- Dodson, C. D., Dyer, L. A., Searcy, J., Wright, Z., & Letourneau, D. K. (2000). Cenocladamide, a dihydropyridone alkaloid from *Piper cenocladum*. *Phytochemistry*, 53, 51–54. [https://doi.org/10.1016/S0031-9422\(99\)00446-X](https://doi.org/10.1016/S0031-9422(99)00446-X).
- Dognini, J., Meneghetti, E. K., Teske, M. N., Beghini, I. M., Rebelo, R. A., Dalmarco, E. M., De Gasper, A. L. (2012). Antibacterial activity of high safrole contain essential oils from *Piper xylosteoides* (Kunth) Steudel. *Journal of Essential Oil Research*, 24(6), 539–543. <https://doi.org/10.1080/10412905.2012.676768>.
- Dong, X., Lin, D., Luo, Z., et al. (2022). The role of MCF-7 cell line in breast cancer research: A review. *Oncology Letters*, 24(2), 263.
- Drenth, A., & Guest, D. I. (2004). Diversity and Management of *Phytophthora* in Southeast Asia. In *Phytophthora in the tropics* (pp. 30–41). Australian Centre for International Agricultural Research.

- Duraipandiyan, V., & Ignacimuthu, S. (2011). Antifungal activity of traditional medicinal plants from Tamil Nadu, India. *Asian Pacific Journal of Tropical Biomedicine*, 1(SUPPL. 2), S204–S215. [https://doi.org/10.1016/S2221-1691\(11\)60157-3](https://doi.org/10.1016/S2221-1691(11)60157-3).
- Efdi, Mai. (2024). Isolation, Identification And  $\alpha$ -glucosidase Inhibition Evaluation Of A Phenolic Compound From *Elaeocarpus Mastersii* King Leaves. *E3S Web of Conferences* (Vol. 503).
- Eloff, J. N., Katerere, D. R., & McGaw, L. J. (2021). The antifungal activity of twenty-four Southern African *Combretum* species (Combretaceae). *South African Journal of Botany*, 112, 434–438.
- EUCAST. (2022). *Definitive document E.DEF 9.4: Method for the determination of broth dilution minimum inhibitory concentrations of antifungal agents for yeasts*. European Committee on Antimicrobial Susceptibility Testing.
- Fernández, M. S., Padín, P. M., & Vázquez, J. A. (2023). Antifungal activity of plant extracts: A review of the last decade. *Plants*, 12(3), 345.
- Fujii, S., Nishimura, S., & Yoneda, T. (2006). Altitudinal distribution of Fagaceae in West Sumatra. *Tropics*, 15(2), 153–163. <https://doi.org/10.3759/tropics.15.153>.
- Gaia, A. M., Yamaguchi, L. F., & Kato, M. J. (2014). Benzopyrans and amides from *Piper aduncum* and their antifungal activity. *Natural Product Research*, 28(20), 1688–1692.
- Gautam, A. K., Gupta, N., & Narayan, A. (2022). *Colletotrichum gloeosporioides*: Pathogen biology, diversity and management. *Journal of Plant Pathology*, 104(1), 1–17.
- Gomez, L. A., Stashenko, E., & Fuentes, J. L. (2020). Chemical composition and antifungal activity of the essential oil and various extracts of *Piper auritum* Kunth. *Journal of Essential Oil Research*, 32(1), 45–53.
- Goutelle, S., Maurin, M., Rougier, F., Barbaut, X., Bourguignon, L., Ducher, M., & Maire, P. (2023). The Hill equation: a review of its capabilities in pharmacological modelling. *Fundamental & Clinical Pharmacology*, 37(2), 259–271.
- Guerrini, A., Sacchetti, G., Rossi, D., Paganetto, G., Muzzoli, M., Andreotti, E., Bruni, R. (2009). Bioactivities of *Piper aduncum* L. and *Piper obliquum* Ruiz & Pavon (Piperaceae) essential oils from Eastern Ecuador. *Environmental Toxicology and Pharmacology*, 27(1), 39–48. <https://doi.org/10.1016/j.etap.2008.08.002>.

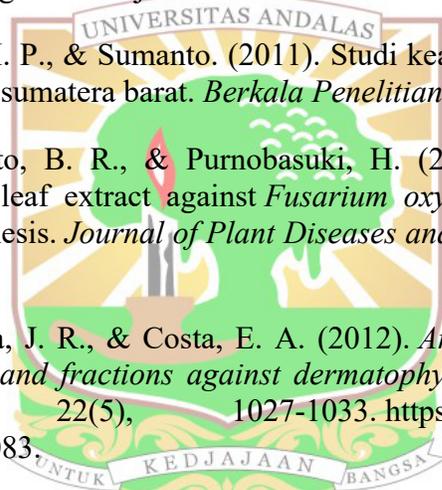
- Gupta, A., & Singh, N. B. (2023). Plant extracts in the management of plant diseases: mechanisms and applications. *Journal of Plant Diseases and Protection*, 130(1), 1–15.
- Gupta, A., Singh, V. K., & Kumar, A. (2021). \*4-Nerolidylcatechol from Piper aduncum: A potent antifungal agent against Colletotrichum species\*. *Pesticide Biochemistry and Physiology*, 173, 104777. <https://doi.org/10.1016/j.pestbp.2021.104777>.
- Hartemink, A. E. (2010). *The invasive shrub Piper aduncum in Papua New Guinea: A review*. *Journal of Tropical Forest Science*, 22(2), 202–213.
- Heng, T. S., & Joo, G. K. (2017). Rubber. *Encyclopedia of Applied Plant Sciences*, 3, 402–409. <https://doi.org/10.1016/B978-0-12-394807-6.00175-1>
- Heung, K. M., Chai, T. T., & Wong, F. C. (2008). Antioxidant and tyrosinase inhibition activities of *Piper* species. *Journal of Agricultural and Food Chemistry*, 56(9), 3037–3042.
- Huang, W. Y., Cai, Y. Z., & Zhang, Y. (2010). Natural phenolic compounds from medicinal herbs and dietary plants: potential use for cancer prevention. *Nutrition and Cancer*, 62(1), 1–20.
- Hübsch, Z., Van Zyl, R. L., Cock, I. E., & Van Vuuren, S. F. (2014). Interactive antimicrobial and toxicity profiles of conventional antimicrobials with Southern African medicinal plants. *South African Journal of Botany*, 93, 185–197. <https://doi.org/10.1016/j.sajb.2014.04.005>.
- 1 Matanmi, E., et al. (2019). "Antifungal activity and GC-MS analysis of hexane extract of *Piper aduncum* leaves." *South African Journal of Botany*, 125, 34-41.
- Isman, M. B. (2020). Botanical insecticides in the twenty-first century-fulfilling their promise? *Annual Review of Entomology*, 65, 233–249.
- Jayasinghe, C. K., Fernando, T. H. P. S., & Priyanka, U. M. S. (2023). Integrated disease management for sustainable rubber production. *Crop Protection*, 165, 106168.
- Kang, H., Lee, J.H., Kim, S.J., et al. (2022). Cytotoxic effects of natural flavonoids on human breast cancer MCF-7 cells using MTT assay. *BMC Complementary Medicine and Therapies*, 22, 115.
- Kato, M. J., & Furlan, M. (2007). Chemistry and evolution of the Piperaceae. *Pure and Applied Chemistry*, 79(4), 529–538. <https://doi.org/10.1351/pac200779040529>.

- Khan, M., Khan, A. U., & Hasan, M. A. (2021). Antifungal activity of medicinal plant extracts against phytopathogenic fungi: Mechanisms and applications. *European Journal of Plant Pathology*, *159*(1), 1–20.
- Krishnan, A., Joseph, L., & Roy, C. B. (2019). An insight into *Hevea* - *Phytophthora* interaction: The story of *Hevea* defense and *Phytophthora* counter defense mediated through molecular signalling. *Current Plant Biology*, *17*, 33–41. <https://doi.org/10.1016/j.cpb.2018.11.009>.
- Kumar, P., Nagarajan, A., & Uchil, P.D. (2023). Analysis of Cell Viability by the MTT Assay. *Cold Spring Harb Protoc*, *2023*(1), pdb.prot102469.
- Kumar, S., Sharma, S., & Rana, S. (2021). Bioactive phenolic compounds from *Piper porphyrophyllum* with antifungal activity against *Corynespora cassiicola*. *Natural Product Research*, *35*(8), 1391–1395.
- Kumar, S., Mishra, A., & Pandey, A.K. (2020). Antioxidant mediated protective effect of piperine against benzo[a]pyrene induced cytotoxicity and oxidative stress. *Environmental Toxicology and Pharmacology*, *78*, 103385. <https://doi.org/10.1016/j.etap.2020.103385>.
- Kumar, A., Singh, B., & Singh, K. (2020). Metabolic profiling of *Piper* species using UPLC-ESI-QTOF-MS/MS and multivariate analysis. *Industrial Crops and Products*, *154*, 112714.
- Kumar, A., & Sharma, S. (2011). Potential non-edible oil resources as biodiesel feedstock: An Indian perspective. *Renewable and Sustainable Energy Reviews*, *15*(4), 1791–1800. <https://doi.org/10.1016/j.rser.2010.11.020>.
- Kuswinanti, T., Syamsuddin, & Mustari, K. (2022). Kejadian dan intensitas penyakit antraknosa (*Colletotrichum* leaf disease) pada pembibitan karet di Sulawesi Selatan. *Jurnal Fitopatologi Indonesia*, *18*(1), 1–9.
- Lago, G., Chen, A., Claudia, M., Young, M., Oliveira, A. De, Kato, M. J., & Guimara, E. F. (2009). Prenylated benzoic acid derivatives from *Piper aduncum* L. and their antimicrobial activity. *Phytochemistry Letters*, *2*, 96–98. <https://doi.org/10.1016/j.phytol.2009.01.001>.
- Lago, J. H. G., & Kato, M. J. (2007). 3 $\alpha$ ,4 $\alpha$ -Epoxy-2-piperidone, a new minor derivative from leaves of *Piper crassinervium* Kunth (Piperaceae). *Natural Product Research*, *21*(10), 910–914. <https://doi.org/10.1080/14786410601130711>.
- Lee, H. B., Kim, J. C., & Kim, C. J. (2022). *In vitro* antifungal activity of *Piper* species extracts against *Corynespora cassiicola* isolated from tomato. *The Plant*

- Lee, S. J., Kim, J. E., & Park, H. J. (2022). Inhibition of appressorium formation in *Colletotrichum gloeosporioides* by *Piper betle* extract. *Plant Pathology Journal*, 38(3), 218–225.
- Lee, S. E., Park, B. S., Kim, M. K., Choi, W. S., Kim, H. T., Cho, K. Y., Lee, H. S. (2001). Fungicidal activity of piperonaline, a piperidine alkaloid derived from long pepper, *Piper longum* L., against phytopathogenic fungi. *Crop Protection*, 20(6), 523–528. [https://doi.org/10.1016/S0261-2194\(00\)00172-1](https://doi.org/10.1016/S0261-2194(00)00172-1).
- Liu, X., Ouyang, C., Wang, Q., Li, Y., Yan, D., Yang, D., Guo, M. (2017). Effects of oil extracts of *Eupatorium adenophorum* on *Phytophthora capsici* and other plant pathogenic fungi in vitro. *Pesticide Biochemistry and Physiology*, 140, 90–96. <https://doi.org/10.1016/j.pestbp.2017.06.012>.
- Lopes, J. J., Marx, C., Ingrassia, R., Picada, J. N., Pereira, P., & de Barros Falcão Ferraz, A. (2012). Neurobehavioral and toxicological activities of two potentially CNS-acting medicinal plants of Piper genus. *Experimental and Toxicologic Pathology*, 64(1–2), 9–14. <https://doi.org/10.1016/j.etp.2010.05.012>.
- Martinez, A. T., Ruiz-Dueñas, F. J., & Camarero, S. (2020). Biodegradation of botanical fungicides in soil: A review. *Science of The Total Environment*, 703, 134947.
- Marques, J. V., Oliveira, D. F., & Carvalho, D. A. (2020). Chemical composition and antifungal activity of *Piper aduncum* essential oil and fractions against *Ceratocystis fimbriata*. *Natural Product Research*, 34(15), 2195–2199. <https://doi.org/10.1080/14786419.2019.1587428>.
- Mgbeahuruike, E. E., Yrjönen, T., Vuorela, H., & Holm, Y. (2021). Bioactive compounds from medicinal plants: Focus on *Piper* species. *South African Journal of Botany*, 142, 54–69.
- Mohammed, C. L., Rimbawanto, A., & Page, D. E. (2014). Management of basidiomycete root- and stem-rot diseases in oil palm, rubber and tropical hardwood plantation crops. *Forest Pathology*, 44(6), 428–446. <https://doi.org/10.1111/efp.12140>.
- Mohd, M. H., Sariah, M., & Zainal Abidin, M. A. (2021). *Ganoderma* species associated with basal stem rot of oil palm and rubber in Malaysia. *Journal of Oil Palm Research*, 33(1), 132–142.
- Moghaddam, G., Ebrahimi, S. A., Rahbar-Roshandel, N., & Foroumadi, A. (2015). Antiproliferative activity of flavonoids: Influence of the sequential

methoxylation state of the flavonoid structure. *Phytotherapy Research*, 29(4), 513–522.

- Morandim-Giannetti, A. A., Pin, A. R., Pietro, N. A. S., Oliveira, H. C., Mendes-Giannini, M. J. S., Alecio, A. C., ... Furlan, M. (2010). Composition and antifungal activity against *Cryptococcus neoformans* and *Candida* spp. of the essential oil from *Piper aduncum* L. *Journal of Medicinal Food*, 13(6), 1491–1495.
- Moshi, A. P., & Matoju, I. (2017). The status of research on and application of biopesticides in Tanzania. Review. *Crop Protection*, 92, 16–28. <https://doi.org/10.1016/j.cropro.2016.10.008>.
- Muharini, R., Liu, Z., Lin, W., & Proksch, P. (2015). New amides from the fruits of *Piper retrofractum*. *Tetrahedron Letters*, 56(19), 2521–2525. <https://doi.org/10.1016/j.tetlet.2015.03.116>
- Munawaroh, E., Astuti, I. P., & Sumanto. (2011). Studi keanekaragaman dan potensi suku piperaceae di sumatera barat. *Berkala Penelitian Hayati*, 5A, 35–40.
- Mutiarasari, D., Budiarto, B. R., & Purnobasuki, H. (2021). Antifungal activity of *Piper aduncum* leaf extract against *Fusarium oxysporum* and its effect on ergosterol biosynthesis. *Journal of Plant Diseases and Protection*, 128(3), 789–798.
- Nascimento, J. C., Paula, J. R., & Costa, E. A. (2012). Antifungal activity of *Piper aduncum* extracts and fractions against dermatophytes. *Revista Brasileira de Farmacognosia*, 22(5), 1027–1033. <https://doi.org/10.1590/S0102-695X2012005000083>
- Nandris, D., Nicole, M., & Geiger, J. P. (1987). Root Rot Diseases of Rubber Tree. *Institut Francais de Recherche Scientifique Pour Le Developpement En Cooperation*, (4).
- Narasimhan, B., & Dhake, A. S. (2006). Antibacterial principles from *Myristica fragrans* seeds. *Journal of Medicinal Food*, 9(3), 395–399.
- Navickiene, H. M. D., Alécio, A. C., Kato, M. J., Bolzani, V. D. S., Young, M. C. M., Cavalheiro, A. J., & Furlan, M. (2000). Antifungal amides from *Piper hispidum* and *Piper tuberculatum*. *Phytochemistry*, 55(6), 621–626. [https://doi.org/10.1016/S0031-9422\(00\)00226-0](https://doi.org/10.1016/S0031-9422(00)00226-0).
- Nordin, M. A. F., Wan Harun, W. H. A., Razak, F. A., & Musa, M. Y. (2014). Growth inhibitory response and ultrastructural modification of oral-associated candidal reference strains (ATCC) by *Piper betle* L. extract. *International Journal of Oral Science*, 6(1), 15–21. <https://doi.org/10.1038/ijos.2013.97>.



- Nugroho, A. E., Malik, A., & Pramono, S. (2020). Total phenolic and flavonoid contents and antioxidant activity of *Piper porphyrophyllum* N.E. Br. extracts. *Pharmacognosy Journal*, 12(6), 1365–1370.
- Ogbebor, N. O., Adekunle, A. T., Eghafona, N. O., & Ikponmwosa, A. (2015). *In vitro* and *in vivo* synthetic fungicides control of *Rigidoporus microporus* on Para rubber in Nigeria. *Journal of Crop Protection*, 4(4), 477–485.
- Ogbemudia, F. O., & Thompson, A. R. (2014). Phytochemical screening and antifungal activity of leaf extracts of *Piper guineense* Schumach. & Thonn. against *Candida albicans*. *International Journal of Current Microbiology and Applied Sciences*, 3(12), 1059–1066.
- Oghenekaro, A. O., Kovalchuk, A., Raffaello, T., Camarero, S., Gressler, M., Henrissat, B., Asiegbu, F. O. (2020). Genome sequencing of *Rigidoporus microporus* provides insights on genes important for wood decay, latex tolerance and interspecific fungal interactions. *Scientific Reports*, 10(1), Article 5250. <https://doi.org/10.1038/s41598-020-62150-4>.
- Okigbo, R. N., & Mmeka, E. C. (2006). An appraisal of phytomedicine in Africa. *KMITL Science and Technology Journal*, 6(2), 83–94.
- Onokpise, O., & Louime, C. (2012). The potential of the South American leaf blight as a biological agent. *Sustainability*, 4(11), 3151–3157. <https://doi.org/10.3390/su4113151>.
- Orjala, J., Erdelmeier, C. A. J., Wright, A. D., Rali, T., & Sticher, O. (1989). Dillapiol derivatives from *Piper aduncum*. *Phytochemistry*, 28(9), 2399–2402.
- Pacheco, A. G., de Araújo, M. H., da Silva, J. K. R., & Maia, J. G. S. (2016). Chemical composition and biological activities of essential oils from *Piper aduncum* L. growing in the Brazilian Amazon. *Journal of Essential Oil Research*, 28(4), 303–309.
- Parra, J. E., Delgado, W. A., & Cuca, L. E. (2011). Cumanensic acid, a new chromene isolated from *Piper cf. cumanense* Kunth. (Piperaceae). *Phytochemistry Letters*, 4(3), 280–282. <https://doi.org/10.1016/j.phytol.2011.04.015>.
- Parmar, V. S., Jain, S. C., Bisht, K. S., Jain, R., Taneja, P., Jha, A., Boll, P. M. (1997). Phytochemistry of the genus *Piper*. *Phytochemistry*, 46(4), 597–673. [https://doi.org/10.1016/S0031-9422\(97\)00328-2](https://doi.org/10.1016/S0031-9422(97)00328-2).
- Parmar, V. S., Sharma, S., Singh, S., & Kumar, A. (2022). Anticancer potential of piperine: A comprehensive review. *Life Sciences*, 302, 120661.

- Pauli, A., & Kubeczka, K. H. (2010). \*Essential oils analysis by capillary gas chromatography and carbon-13 NMR spectroscopy\*. John Wiley & Sons.
- Pineda, J. B., Rojas, E. B., & Espinoza, A. M. (2012). Antifungal activity of *Piper* extracts against *Colletotrichum* species. *Agronomía Mesoamericana*, 23(1), 153–161.
- Prakash, B., Singh, P., Mishra, P. K., & Dubey, N. K. (2010). *Safety assessment of Zanthoxylum alatum* Roxb. essential oil, its antifungal, anti-aflatoxin, and antioxidant activity. *International Journal of Food Microbiology*, 153(1-2), 114–120. <https://doi.org/10.1016/j.ijfoodmicro.2011.10.021>.
- Priyadarshan, P. M. (2003). Contributions of weather variables for specific adaptation of rubber tree (*Hevea brasiliensis* Muell.-Arg) clones. *Genetics and Molecular Biology*, 26(4), 435–440. <https://doi.org/10.1590/S1415-47572003000400006>.
- Radwan, M. M., Tabanca, N., Wedge, D. E., Tarawneh, A. H., & Cutler, S. J. (2014). Antifungal compounds from turmeric and nutmeg with activity against plant pathogens. *Fitoterapia*, 99(1), 341–346. <https://doi.org/10.1016/j.fitote.2014.08.021>.
- Rahman, M. A., Uddin, M. J., & Alim, M. A. (2023). *Piperaduncin E*, a new antifungal amide from *Piper aduncum* against *Rigidoporus microporus*. *Phytochemistry Letters*, 53, 85–91. <https://doi.org/10.1016/j.phytol.2022.11.007>.
- Rather, R. A., & Bhagat, M. (2018). Cancer chemoprevention and piperine: Molecular mechanisms and therapeutic opportunities. *Frontiers in Cell and Developmental Biology*, 6, 10.
- Rattan, R. S., & Nair, K. S. S. (2015). Biology and control of *Rigidoporus microporus*, the cause of white root rot disease of rubber. *Journal of Rubber Research*, 18(2), 67–86.
- Regasini, L. O., Cotinguiba, F., Morandim, A. D. A., Kato, M. J., Scorzoni, L., Mendes-Giannini, M. J., ... Furlan, M. (2009). Antimicrobial activity of *Piper arboreum* and *Piper tuberculatum* (Piperaceae) against opportunistic yeasts. *African Journal of Biotechnology*, 8(12), 2866–2870. <https://doi.org/10.4314/ajb.v8i12.60928>.
- Reigada, J. B., Tcacenco, C. M., Andrade, L. H., Kato, M. J., Porto, A. L. M., & Lago, J. H. G. (2007). Chemical constituents from *Piper marginatum* Jacq. (Piperaceae)-antifungal activities and kinetic resolution of (RS)-marginatumol by *Candida antarctica* lipase (Novozym 435). *Tetrahedron Asymmetry*, 18(9), 1054–1058. <https://doi.org/10.1016/j.tetasy.2007.05.006>.

- Ríos, J. L., & Recio, M. C. (2005). Medicinal plants and antimicrobial activity. *Journal of Ethnopharmacology*, 100(1–2), 80–84.
- Rodrigues, E. R., Nogueira, N. G. P., Zocolo, G. J., Leite, F. S., Januario, A. H., Fusco-Almeida, A. M., ... Pietro, R. C. L. R. (2012). *Pothomorphe umbellata*: Antifungal activity against strains of *Trichophyton rubrum*. *Journal de Mycologie Medicale*, 22(3), 265–269. <https://doi.org/10.1016/j.mycmed.2012.05.005>.
- Rodriguez, M. L., Cartagena, C., & Cardona, W. (2022). Phytochemical profile and antifungal activity of *Piper* spp. extracts obtained with different solvents. *Industrial Crops and Products*, 176, 114363.
- Roh, J. S. (2020). Piperlongumine, a potent anticancer agent: Perspectives on contemporary strategies for improving its bioavailability. *Pharmaceutics*, 12(10), 939.
- Roslan, A., & Idris, A. S. (2018). *Ganoderma* species associated with basal stem rot of oil palm in Malaysia. *Journal of Oil Palm Research*, 30(3), 403–414.
- Rukayadi, Y., & Hwang, J. K. (2022). Recent advances in antimicrobial compounds from *Piper* species. *Journal of Ethnopharmacology*, 283, 114676.
- Salehi, B., Zakaria, Z. A., Gyawali, R., Ibrahim, S. A., Rajkovic, J., Shinwari, Z. K., ... Setzer, W. N. (2019). *Piper* species: A comprehensive review on their phytochemistry, biological activities and applications. *Molecules*, 24(7), 1364.
- Salleh, W. M. N. H. W., Ahmad, F., Yen, K. H., & Sirat, H. M. (2011). Chemical compositions, antioxidant and antimicrobial activities of essential oils of *Piper caninum* Blume. *International Journal of Molecular Sciences*, 12(11), 7720–7731. <https://doi.org/10.3390/ijms12117720>.
- Salleh, W. M. N. H. W., Ahmad, F., Yen, K. H., & Sirat, H. M. (2014). Tyrosinase inhibition and antioxidant activities of *Piper porphyrophyllum* N.E. Br. extracts. *Pharmacognosy Journal*, 6(1), 36–40.
- Salleh, W. M. N. H. W., Ahmad, F., Yen, K. H., & Sirat, H. M. (2012). Chemical compositions and antimicrobial activities of the essential oils of *Piper porphyrophyllum* (Lindl.) N.E. Br. *Journal of Essential Oil Research*, 24(4), 369–373.
- Santos, P. R. D., Moreira, D. L., Guimarães, E. F., & Kaplan, M. A. C. (2013). Essential oil analysis of four *Piper* species from the Brazilian Atlantic forest. *Journal of Essential Oil Research*, 25(3), 203–208.

- Scott, I. M., Jensen, H. R., Philogène, B. J. R., & Arnason, J. T. (2021). A review of *Piper* spp. (Piperaceae) phytochemistry, insecticidal activity and mode of action. *Phytochemistry Reviews*, 20(1), 245–292.
- Scott, I. M., Jensen, H. R., Philogène, B. J., & Arnason, J. T. (2005). A review of *Piper* spp. (Piperaceae) phytochemistry, insecticidal activity and mode of action. *Phytochemistry Reviews*, 4(2-3), 143-153. <https://doi.org/10.1007/s11101-005-2487-5>.
- Sepúlveda, L., Ascacio, A., Rodríguez-Herrera, R., Aguilera-Carbó, A., & Aguilar, C. N. (2003). Ellagic acid: Biological properties and biotechnological development for production processes. *African Journal of Biotechnology*, 10(22), 4518–4523.
- Shaikh, J., Ankola, D. D., Beniwal, V., Singh, D., & Kumar, M. N. V. R. (2021). Nanoparticle encapsulation improves oral bioavailability of curcumin by at least 9-fold when compared to curcumin administered with piperine as absorption enhancer. *European Journal of Pharmaceutical Sciences*, 37(3–4), 223–230.
- Sharma, A., Gupta, P., & Prerna, P. (2019). Antifungal activity of selected medicinal plants against *Colletotrichum gloeosporioides*. *Journal of Plant Pathology*, 101(3), 523-531. <https://doi.org/10.1007/s42161-018-00226-x>.
- Sharma, N., & Tripathi, A. (2008). Effects of *Citrus sinensis* (L.) Osbeck epicarp essential oil on growth and morphogenesis of *Aspergillus niger* (L.) Van Tieghem. *Microbiological Research*, 163(3), 337–344.
- Silva, J., Souza, P. E., & Monteiro, F. P. (2014). Antifungal activity using medicinal plant extracts against pathogens of coffee tree. *Revista Brasileira de Plantas Medicinai*s, 16(3), 539–544.
- Silva, J. K. R., Figueiredo, P. L. B., Byler, K. G., & Setzer, W. N. (2020). Antifungal activity of *Piper* essential oils against post-harvest phytopathogenic fungi. *Food Chemistry*, 289, 403–410.
- Silva, J. K. R., Figueiredo, P. L. B., Byler, K. G., & Setzer, W. N. (2023). Dose-response modeling in plant pathology: a review. *Phytopathology*, 113(2), 175–187.
- Silva, R. F., Rabi, J. A., & Kato, M. J. (2019). Eupomatenoid-5 induces apoptosis in human breast cancer cells via mitochondrial pathway. *Chemico-Biological Interactions*, 304\*, 139–147.
- Singburadom, N. (2015). Hydroxychavicol from *Piper betle* leaves is an antifungal activity against plant pathogenic fungi. *Journal of Biopesticides*, 8(2), 82–92.

- Singh, S., Kumar, R., & Giri, B. S. (2020). *Piperine: A comprehensive review of pre-clinical and clinical investigations*. *Current Pharmacology Reports*, 6(5), 300–309. <https://doi.org/10.1007/s40495-020-00234-5>.
- Singha, I. M., Kakoty, Y., Unni, B. G., & Das, J. (2011). Control of *Fusarium* wilt of tomato by *Piper betle* L. leaf extract. *Journal of Agricultural Technology*, 7(4), 1015–1027.
- Siri-udom, S., Suwannarach, N., & Lumyong, S. (2016). Applications of volatile compounds acquired from *Muscodora heveae* against white root rot disease in rubber trees (*Hevea brasiliensis* Müll. Arg.) and relevant allelopathy effects. *Fungal Biology*, 121(6–7), 573–581.
- Subik, K., Lee, J.F., Baxter, L., Strzepek, T., Costello, D., Crowley, P., et al. (2010). The Expression Patterns of ER, PR, HER2, CK5/6, EGFR, Ki-67 and AR by Immunohistochemical Analysis in Breast Cancer Cell Lines. *Breast Cancer (Auckl)*, 4, 35–41.
- Suffness, M., & Pezzuto, J. M. (1990). Assays related to cancer drug discovery. In *Methods in Plant Biochemistry: Assays for Bioactivity* (Vol. 6, pp. 71–133). Academic Press.
- Sugden, A., Fahrenkamp-Uppenbrink, J., Malakoff, D., & Vignieri, S. (2015). Forest health in a changing world. *Science*, 349(6250), 800–801. <https://doi.org/10.1126/science.aac8899>.
- Tabopda, T. K., Ngoupayo, J., Liu, J., Mitaine-Offer, A. C., Tanoli, S. A. K., Khan, S. N., ... Luu, B. (2008). Bioactive aristolactams from *Piper umbellatum*. *Phytochemistry*, 69(8), 1726–1731. <https://doi.org/10.1016/j.phytochem.2008.02.018>
- Takooree, H., Aumeeruddy, M. Z., Rengasamy, K. R. R., Venugopala, K. N., Jeewon, R., Zengin, G., & Mahomoodally, M. F. (2019). A systematic review on black pepper (*Piper nigrum* L.): from folk uses to pharmacological applications. *Critical Reviews in Food Science and Nutrition*, 59(sup1), S210–S243.
- Tanaka, H., Tamai, K., & Futai, K. (2023). Membrane lipid composition and sensitivity to antifungal agents in *Rigidoporus microporus*. *Mycological Progress*, 22(2), Article 18.
- Tangarife-Castaño, V., Correa-Royero, J. B., Roa-Linares, V. C., Pino-Benitez, N., Betancur-Galvis, L. A., Durán, D. C., ... Mesa-Arango, A. C. (2014). Anti-dermatophyte, anti-*Fusarium* and cytotoxic activity of essential oils and plant extracts of Piper genus. *Journal of Essential Oil Research*, 26(3), 221–227. <https://doi.org/10.1080/10412905.2014.882279>.

- Teale, S. A., & Castello, J. D. (2011). Regulators and terminators: The importance of biotic factors to a healthy forest. In *Forest Health: An Integrated Perspective* (pp. 71–88). Cambridge University Press.
- Teoh, Y. P., Don, M. M., & Ujang, S. (2022). *Inhibition of ligninolytic enzymes by plant extracts in Rigidoporus microporus*. *Forest Pathology*, 52(1), e12734. <https://doi.org/10.1111/efp.12734>.
- Thind, T. S., & Schilder, A. C. (2014). Fungicide resistance in *Colletotrichum* spp. causing anthracnose on fruit crops. In *Fungicide Resistance in Crop Protection: Risk and Management* (pp. 168–185). CABI.
- Trindade, F. T. T., Stabeli, R. G., Facundo, V. A., Cardoso, C. T., da Silva, M. A., Gil, L. H. S., ... e Silva, A. de A. (2012). Evaluation of larvicidal activity of the methanolic extracts of *Piper alatabaccum* branches and *P. tuberculatum* leaves and compounds isolated against *Anopheles darlingi*. *Brazilian Journal of Pharmacognosy*, 22(5), 979–984. <https://doi.org/10.1590/S0102-695X2012005000039>.
- Valadares, A. C. F., Alves, C. C. F., Alves, J. M., DE DEUS, I. P. B., DE OLIVEIRA FILHO, J. G., Dos Santos, T. C. L., ... Miranda, M. L. D. (2018). Essential oils from *Piper aduncum* inflorescences and leaves: Chemical composition and antifungal activity against *Sclerotinia sclerotiorum*. *Anais Da Academia Brasileira de Ciencias*, 90(3), 2691–2699. <https://doi.org/10.1590/0001-3765201820180033>.
- Van Lierop, P., Lindquist, E., Sathyapala, S., & Franceschini, G. (2015). Global forest area disturbance from fire, insect pests, diseases and severe weather events. *Forest Ecology and Management*, 352, 78–88. <https://doi.org/10.1016/j.foreco.2015.06.010>.
- Vila, R., Tomi, F., Santana, A. I., Gupta, M. P., & Cañigueral, S. (2005). Chemical composition of the essential oil from the leaves of *Piper aduncum* L. from Panama. *Flavour and Fragrance Journal*, 20(6), 613–616.
- Wang, X., et al. (2023). Advances in understanding fungal cell wall biosynthesis and its role in antifungal drug discovery. *Journal of Fungi*, 9(4), 481.
- Wang, Y., Zhang, X., & Li, J. (2023). Mechanism of action of plant-derived antifungal compounds against fungal membrane and cell wall. *Pesticide Biochemistry and Physiology*, 189, 105298.
- Wang, L., Zhang, Y., & Chen, J. (2023). *Antifungal mechanism of piperlongumine against Alternaria alternata by inducing oxidative stress and apoptosis*. *Pesticide Biochemistry and Physiology*, 190, 105322. <https://doi.org/10.1016/j.pestbp.2022.105322>.

- Wang, Y., Zhang, X., & Li, J. (2022). Synergistic antifungal effects of plant essential oils and synthetic fungicides against postharvest pathogens. *Postharvest Biology and Technology*, 183, 111751.
- Wang, X., Zhang, Y., & Li, J. (2019). Degradation kinetics of antifungal compounds from medicinal plants and their impact on fungal growth. *Journal of Applied Microbiology*, 127(5), 1441–1452.
- Wang, Y. H., Morris-Natschke, S. L., Yang, J., Niu, H. M., Long, C. L., & Lee, K. H. (2014). Anticancer Principles from Medicinal Piper (胡椒 Hú Jiāo) Plants. *Journal of Traditional and Complementary Medicine*, 4(1), 8–16. <https://doi.org/10.4103/2225-4110.124811>.
- Wiar, C., Martin, M. T., Awang, K., & Rahmani, M. (2004). Antifungal activity of *Piper porphyrophyllum* N.E. Br. *Phytotherapy Research*, 18(5), 429–430.
- Wingfield, M. J., Brockerhoff, E. G., Wingfield, B. D., & Slippers, B. (2015). Planted forest health: The need for a global strategy. *Science*, 349(6250), 832–836. <https://doi.org/10.1126/science.aac6674>.
- Xu, W. H., & Li, X. C. (2011). Antifungal Compounds from Piper Species. *Current Bioactive Compounds*, 7(4), 262–267. <https://doi.org/10.2174/157340711798375822>.
- Yadav, V., Krishnan, A., & Vohora, D. (2020). A systematic review on *Piper longum* L.: Bridging traditional knowledge and pharmacological evidence for future translational research. *Journal of Ethnopharmacology*, 247, 112255. <https://doi.org/10.1016/j.jep.2019.112255>.
- Zarins, I., Daugavietis, M., & Halimona, J. (2009). Biological activity of plant extracts and their application as ecologically harmless biopesticide. *Scientific Works of the Lithuanian Institute of Horticulture and Lithuanian University of Agriculture*, 28(3), 269–280.
- Zaynab, M., Fatima, M., Abbas, S., Sharif, Y., Umair, M., Zafar, M. H., & Bahadar, K. (2018). Role of secondary metabolites in plant defense against pathogens. *Microbial Pathogenesis*, 124, 198–202. <https://doi.org/10.1016/j.micpath.2018.08.034>.
- Zhang, C., Chen, Y., & Li, Y. (2021). Resistance risk assessment for *Corynespora cassiicola* to benzimidazole fungicides. *Plant Disease*, 105(4), 902–909. <https://doi.org/10.1094/PDIS-07-20-1541-RE>.
- Zhang, Y., Li, H., Zhang, J., Wang, H., & Liu, Y. (2021). Antifungal mechanism of plant essential oils: A review. *Industrial Crops and Products*, 171, 113981.

Zhao, J., Zhang, Y., & Li, X. (2021). Anticancer amides from *Piper retrofractum*: Isolation, structural elucidation and biological evaluation. *Bioorganic Chemistry*, 107, 104590.

Zhou, Y., Li, Y., Wang, K., et al. (2022). Natural polyphenols for prevention and treatment of cancer. *Nutrients*, 14(2), 414.

Zhou, X., Li, G., & Xu, J. R. (2019). Efficient approaches for screening pathogenicity genes in *Ceratocystis fimbriata*. *Journal of Fungi*, 5(2), 41.

