

Cover Page



Universiteit Leiden



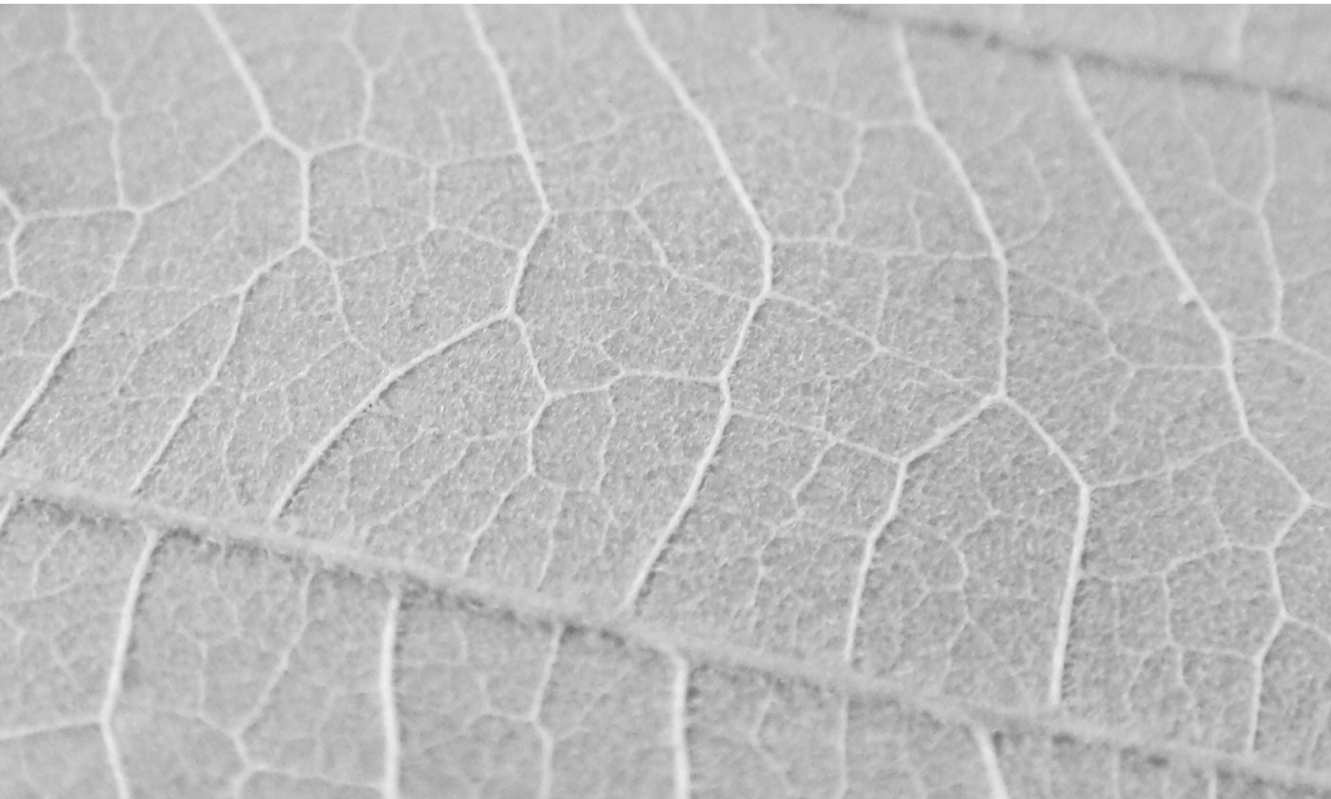
The handle <http://hdl.handle.net/1887/22521> holds various files of this Leiden University dissertation.

Author: Sirichamorn, Yotsawate

Title: Systematics and biogeography of Aganope, Brachypterum and Derris (Fabaceae) in Asia

Issue Date: 2013-11-28

References



References

- Adanson, M. 1763.** *Families des plantes* 2: 322, 327. Vincent, Paris.
- Adema, F. 2000.** Notes on Malesian Fabaceae XX. *Derris* in Thailand and Malesia. *Thai Forest Bulletin (Botany)* 28: 2–16.
- Adema, F. 2003a.** Notes on Malesian Fabaceae (Leguminosae-Papilionoideae). 9. The genus *Paraderris*. *Blumea* 48: 129–144.
- Adema, F. 2003b.** Notes on Malesian Fabaceae (Leguminosae-Papilionoideae). 11. The genus *Derris*. *Blumea* 48: 393–419.
- Akaike, H. 1974.** A new look at the statistical model identification. *IEEE Transactions on Automatic Control* 19: 716–723.
- Ali, J.R. and Aitchison, J.C. 2008.** Gondwana to Asia: plate tectonics, paleogeography and the biological connectivity of the Indian sub-continent from the Middle Jurassic through the latest Eocene (166–35 Ma). *Earth-Science Reviews* 88: 145–166.
- Asmussen, C.B. and Liston, A. 1998.** Chloroplast DNA characters, phylogeny, and classification of *Lathyrus* (Fabaceae). *American journal of Botany* 85: 387–401.
- Aublet, M.F. 1775.** *Histoire des Plantes de la Guiane Francoise* 2. P.F. Didot, Londres, Paris.
- Awasthi N. and Lakhanpal R.N. 1990.** Additions to the Neogene florule from near Bhikhnathoree West Champaran District, Bihar. *Palaeobotanist* 37: 278–283.
- Awasthi, N. 1992.** Indian fossil Legumes. In: *Advance in Legume Systematics part 4. The Fossil Record* (ed. by Herendeen, P.S. and Dilcher, D.L.), pp. 225–250. Royal Botanic garden, Kew.
- Baker, J.G. 1878.** Leguminosae, 89. *Derris* Lour. In: *Flora of British India* 2 (ed. by Hooker, J.D.), pp. 240–246. Reeve & Co., London.
- Baldwin, B.G., Sanderson, M.J., Porter, J.M., Wojciechowski, M.F., Cambell, C.S. and Donoghue, M.J. 1995.** The ITS region of nuclear ribosomal DNA: a valuable source of evidence on angiosperm phylogeny. *Annals of the Missouri Botanical Garden* 82: 247–277.

References

- Bate-Smith, E.C. and Metcalfe, C.R. 1957.** Leuco-anthocyanins. 3. The nature and systematic distribution of tannins in dicotyledonous plants. *Journal of the Linnean Society of London, Botany* 55: 669–705.
- Bentham, G. 1837.** *Commentationes de Leguminosarum Generibus*: 37. J.P. Sollinger Vindobonae.
- Bentham, G. 1838.** *Brachypterum* W. et Arn. In: *Annalen des Wiener Museums de Naturgeschichte* 2: 91, 101. Wien Museum der Naturgeschichte, Wien.
- Bentham, G. 1860.** Synopsis of Dalbergieae, a tribe of Leguminosae. *Journal of the Proceedings of the Linnean Society, Botany* 4 (suppl.): 1–134.
- Berggren, W.A., Kent, D.V., Swisher, C.C., and Aubry, M.-P. 1995.** A revised Cenozoic geochronology and chronostratigraphy. In: *Geochronology, time scales and global stratigraphic correlation* (ed. by Berggren, W.A., Kent, D.V., Aubry, M.-P. and Hardenbol, J.), pp. 129–212. SEPM Special Publication 54.
- Bornman, J.F., Reuber, S., Cen, Y-P. and Weissenböck, G. 1997.** Ultraviolet radiation as a stress factor and the role of protective pigments. In: *Plants and UV-B Responses to Environmental Change* (ed. by Lumsden, P.J.), pp. 157–168. Cambridge University Press, Cambridge.
- Bremer K. 1988.** The limits of amino acid sequence data in angiosperm phylogenetic reconstruction. *Evolution* 42: 795–803.
- Buijsen, J.R.M. 1988.** Revision of the genus *Fordia* (Papilionaceae: Millettieae). *Blumea* 33: 239–261.
- Chandler, G.T., Bayer, R.J. and Crisp, M.D. 2001.** A molecular phylogeny of the endemic Australian genus *Gastrolobium* (Fabaceae: Mirbelieae) and allied genera using chloroplast and nuclear markers. *American journal of Botany* 88: 1675–1687.
- Coley, P.D. and Aide, T.M. 1989.** Red coloration of tropical leaves: a possible antifungal defences. *Journal of Tropical Ecology* 5: 293–300.
- Conti, E., Eriksson, T., Schönenberger, J., Sytsma, K.J. and Baum, D.A. 2002.** Early Tertiary out-of-India dispersal of Crypteroniaceae: evidence from phylogeny and molecular dating. *Evolution* 56: 1931–1942.
- Craib, W.G. 1927.** Contributions to the Flora of Saim. Additamentum 23. *Kew Bulletin* 27: 374–395.

- Craib, W.G. 1928.** *Florae Siamensis Enumeratio* 1, pp. 487–494. Siam Society, Bangkok.
- Cronquist, A. 1988.** *The evolution and classification of flowering plants* 2nd edition. New York Botanical Garden. New York.
- Da Silva, M.J., de Queiroz, L.P., de Azevedo Tozzi, A.M.G., Lewis, G.P. and de Sousa, A.P. 2012.** Phylogeny and biogeography of *Lonchocarpus* sensu lato and its allies in the tribe Millettieae (Leguminosae, Papilionoideae). *Taxon* 61: 93–108.
- Dalzell, N.A. and Gibson, A. 1861.** 33. *Brachypterum*, W. and A. In: *The Bombay Flora*, pp. 76–77. Education Society's Press, Bombay.
- De Queiroz, A., Donoghue, M.J. and Kim, J. 1995.** Separate versus combined analysis of phylogenetic evidence. *Annual Review of Ecology and Systematics* 26: 657–681.
- De Queiroz, L.P. and Lavin, M. 2010.** *Coursetia* (Leguminosae) From Eastern Brazil: Nuclear Ribosomal and Chloroplast DNA Sequence Analysis reveal the Monophyly of Three Caatinga-inhabiting Species. *Systematic Botany* 36: 69–79.
- Dixon, D.J. 1997.** A taxonomic revision of the genus *Austrosteenisia* Geesink (Fabaceae: Millettieae). *Austrobaileya* 5: 79–91.
- Drummond, A.J., Ho, S., Phillips, M. and Rambaut, A. 2006.** Relaxed phylogenetics and dating with confidence. *PLoS Biology* 4: 699–710.
- Drummond, A.J. and Rambaut, A. 2007.** BEAST: Bayesian evolutionary analysis by sampling trees. *BMC Evolutionary Biology* 7, article no. 214.
- Du Puy, D.J. and Labat, J.-N. 2002.** Tribe Millettieae: 5 *Derris*. In: *The Leguminosae of Madagascar* (ed. by Du Puy, D.J.), pp. 393–394. Royal Botanic Gardens, Kew.
- Dunn, S.T. 1910.** *Leptoderris*, a New Genus of Leguminosae. *Bulletin of Miscellaneous Information, Royal Gardens, Kew.* 386–391.
- Dunn, S.T. 1911.** *Ostryocarpus* and a new allied genus *Ostryoderris*. *Bulletin of Miscellaneous Information, Royal Gardens, Kew.* 362–364.
- Evans, S.V., Fellows, L.E. and Bell, E.A. 1985.** Distribution and systematic significance of basic non-protein amino acids and amines in the Tephrosieae. *Biochemical Systematics and Ecology* 13: 271–302.

References

- Felsenstein, J. 1985.** Confidence limits on phylogenies: an approach using the bootstrap. *Evolution* 39: 783–791.
- Fitch, W.M. 1971.** Towards defining the course of evolution: minimum change for a specific tree topology. *Systematic Zoology* 20: 406–416.
- Gasson, P., Wray, E. and Schrire, B.D. 2004.** Wood anatomy of the tribe Millettieae with comments on related papilionoid Leguminosae. *LAWA Journal* 25: 485–545.
- Gaubert, P., Wozencraft, W.C., Cordeiro-Estrela, P. and Veron, G. 2005.** Mosaic of convergences, noise and misleading morphological phylogenies: what's in a viverrid-like carnivoran? *Systematic Biology* 54: 865–894.
- Geesink, R. 1981.** Tribe 6. Tephrosieae (Benth.) Hutch. (1964). In: *Advances in Legume systematics*, part 1 (ed. by Polhill, R.M. and Raven, P.H.), pp. 245–260. Royal Botanic Garden, Kew.
- Geesink, R. 1984.** Scala Millettiearum: A survey of the genera of the Millettieae (Legum.-Pap.) with methodological considerations. *Leiden Botanical Series*, 8.
- Giesen, W., Wulffraat, S., Zieren, M. and Scholten, L. 2007.** *Mangrove guidebook for Southeast Asia*. Food and Agricultural Organisation & Wetlands International, Bangkok.
- Gomes, C.M.R., Gottlieb, O.R., Bettolo, G.B.M., Monache, F.D. and Polhill, R.M. 1981.** Systematic Significance of Flavonoids in *Derris* and *Lonchocarpus*. *Biochemical Systematics and Ecology* 9: 129–147.
- Hall, R. 2002.** Cenozoic geological and plate tectonic evolution of Southeast Asia and the Southwest Pacific: computer-based reconstructions, model and animations. *Journal of Asian Earth Sciences* 20: 353–434.
- Hall, R. 2009.** Southeast Asia's changing palaeogeography. *Blumea* 54: 148–161.
- Hall, T.A. 1999.** Bioedit: a user-friendly biological sequence alignment editor and analysis program for Windows 9.5/98/NT. *Nucleic Acids Symposium Series* 41: 95–98.
- Hamid, A. 1999.** *Derris* Lour. In: *PROSEA: Plant Resources of South-East Asia 12, Medical and Poisonous Plants (1)* (ed. by de Padua, L.S., Bunyaphratharsa, N., and Lemmens, R.H.M.J.), pp. 234–242. Backhuys Publisher, Leiden.

- Harris, A.J. and Xiang, Q.Y. 2009.** Estimating ancestral distributions of lineages with uncertain sister groups: a statistical approach to Dispersal-Vicariance Analysis and a case using *Aesculus* L. (Sapindaceae) including fossils. *Journal of Systematics and Evolution* 47: 349–368.
- Hillis, D.M. 1987.** Molecular versus morphological approaches to systematics. *Annual Review of Ecology and Systematics* 18: 23–42.
- Hillis, D.M. 1998.** Taxonomic sampling, phylogenetic accuracy, and investigator bias. *Systematic Biology* 47: 3–8.
- Ho, S.Y.W. 2007.** Calibrating molecular estimates of substitution rates and divergence times in birds. *Journal of Avian Biology* 38: 409–414.
- Holmgren, P.K., Holmgren, N.H. and Barnett, L.C. 1990.** *Index herbariorum Part I. The herbaria of the world*, 8th ed. New York Botanical Garden, Bronx, New York.
- Hooker, J.D. 1849.** Flora Nigritiana. In: *Niger Flora* (ed. by Hooker, W.J.), pp. 201–577. H. Bailliére, London.
- Hu, J.-M. 2000.** Phylogenetic relationships of the tribe Millettieae and allies – the current status. In: *Advances in Legume Systematics*, part 9 (ed. by Herendeen, P.S. and Bruneau, A.), pp. 299–310. Royal Botanic Gardens, Kew.
- Hu, J.-M., Lavin, M., Wojciechowski, M.F. and Sanderson, M.J. 2000.** Phylogenetic systematics of the tribe Millettieae (Leguminosae) based on chloroplast *trnK/matK* sequences and its implications for evolutionary patterns in Papilionoideae. *American Journal of Botany* 87: 418–430.
- Hu, J.-M., Lavin, M., Wojciechowski, M.F., and Sanderson, M.J. 2002.** Phylogenetic analysis of nuclear ribosomal ITS/5.8S sequences in the tribe Millettieae (Fabaceae): *Poecilanthe-Cyclolobium*, the core Millettieae, and the *Callerya* group. *Systematic Botany* 27: 722–733.
- Hutchinson, J. 1964.** *The genera of flowering plants*. Oxford University Press, Oxford.
- Hutchinson, J. 1973.** *The Families of Flowering Plants Arranged According to a New System Based on Their Probable Phylogeny*, 3rd edition. Oxford University Press, Oxford.
- Jacobs, B.F. 2004.** Palaeobotanical studies from tropical Africa: relevance to the evolution of forest, woodland and savannah biomes. *Philosophical Transactions of the Royal Society B: Biological Sciences* 359: 1573–1583.

References

- Jayasuriya, K.M.G.G., Baskin, J.M., Baskin, C.C. and Fernando, M.T.R. 2012.** Variation in seed dormancy and storage behavior of three liana species of *Derris* (Fabaceae, Faboideae) in Sri Lanka and ecological implications. *Research Journal of Seed Science* 5: 1–18.
- Kajita, T., Ohashi, H., Tateshi, Y., Bailey, C.D. and Doyle, J.J. 2001.** *rbcL* and legume phylogeny, with particular reference to Phaseoleae, Millettieae and allies. *Systematic Botany* 26: 515–536.
- Kirkbride, J.H., Gunn, C.R. and Weitzman, A.L. 2003.** *Fruits and seeds of genera in subfamily Faboideae (Fabaceae)*. U.S. Department of Agriculture, Washington D.C.
- Knuth, P. 1908.** *Handbook of flower pollination: based on Hermann Müller's work "The fertilisation of flowers by insects"* 2. Clarendon Press, Oxford.
- Kursar, T.A. and Coley, P.D. 1992.** Delayed greening in tropical leaves: an antiherbivore defense? *Biotropica* 24: 256–262.
- Lavin, M., Eshbaugh, E., Hu, J.M., Mathews, S. and Sharrock, R.A. 1998.** Monophyletic subgroups of the tribe Millettieae (Leguminosae) as revealed by phytochrome nucleotide sequence data. *American Journal of Botany* 85: 412–433.
- Lavin, M., Pennington, R.T., Klitgaard, B., Sprent, J.I., De Lima, H.C. and Gasson, P. 2001.** The dalbergioid legumes (Fabaceae): delimitation of a pantropical monophyletic clade. *American Journal of Botany* 88: 503–533.
- Lavin, M., Herendeen, P.S. and Wojciechowski, M.F. 2005.** Evolutionary rates analysis of Leguminosae implicates a rapid diversification of lineages during Tertiary. *Systematic Biology* 54: 575–594.
- Lebrun, J.-P. and Stork, A.L. 2008a.** *Tropical African Flowering Plants: Ecology and Distribution, Volume 3: Mimosaceae - Fabaceae (incl. Derris)*. Conservatoire Botanique de Genève, Geneva.
- Lebrun, J.-P. and Stork, A.L. 2008b.** *Tropical African Flowering Plants: Ecology and Distribution, Volume 4: Fabaceae (Desmodium-Zornia)*. Conservatoire Botanique de Genève, Geneva.
- Li, Y., Dressler, S., Zhang, D. and Renner, S.S. 2009.** More Miocene dispersal between Africa and Asia – the case of *Bridelia* (Phyllanthaceae). *Systematic Botany* 34: 521–529.

- Linnaeus, C. 1747.** *Flora Zeylanica*. 1. J. Westenium, Amsterdam.
- Mabberley, D.J. 1997.** *The Plant Book. 2nd Edition*. Cambridge University Press, Cambridge.
- Macbride, J.F. 1943.** *Flora of Peru*. Publications of the Field Museum of Natural History, Botanical Series 13: 256–267.
- MacKinnon, J. and MacKinnon, K. 1986.** *Review of the Protected Areas System in the Indo Malayan Realm*. IUCN. Gland.
- MacKinnon, J. 1997.** *Protected areas systems review of the Indomalayan realm*. World Bank, Asian Bureau for Conservation (ABC) and World Conservation Monitoring Center (WCMC), Cambridge.
- Maddison, W.P. and Maddison, D.R. 2011.** Mesquite: A modular system for evolutionary analysis, version 2.7.5. Available from <http://mesquiteproject.org> (last checked 15 Dec. 2012).
- McKenna, M.C.C. 1973.** Sweepstakes, filters, corridors, Noah's Arks, and beached Viking funeral ships in paleogeography. *Implications of continental drift to the earth sciences* (ed. by D.H. Tarling and S.K. Runcorn), pp. 291–304. Academic Press, London.
- McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold, K., Nicolson, D.H., Prado, J., Silva, P.C., Skog, J.E., Wiersema, J.H. and Turland, N.J. 2006.** International Code of Botanical Nomenclature (Vienna Code): adopted by the Seventeenth International Botanical Congress Vienna, Austria, July 2005. *Regnum Vegetabile* 146. Gantner, Ruggell, Liechtenstein.
- Merrill, E.D. 1923.** *Derris philippinensis* Merr. In: *An enumeration of Philippine flowering plants* 2, pp. 300–301. Bureau of printing, Manila.
- Miller, K.G., Mountain, G.S., Wright, J.D. and Browning, J.V. 2011.** A 180-million-year record of sea level and ice volume variations from continental margin and deep-sea isotopic records: *Oceanography* 24: 40–53.
- Miller, M.A., Pfeiffer, W. and Schwartz, T. 2010.** Creating the CIPRES Science Gateway for inference of large phylogenetic trees. *Proceedings of the Gateway Computing Environments Workshop (GCE)*, pp.1–8. New Orleans.

References

- Miquel, F.A.W. 1855.** *Flora van Nederlandsch-Indië* 1. Van der Post, Amsterdam.
- Mitra, S. and Banerjee, M. 2004.** Fossil fruit *Derrisocarpon miocenicum* gen. et sp. nov. and leaflet *Derrisophyllum simalicum* gen. et sp. nov. cf. *Derris trifoliata* Lour. of Fabaceae from Siwalik sediments of Darjeeling foothills, eastern Himalaya, India with remarks on site of origin and distribution of the genus. *Phytomorphology* 54: 253–263.
- Morley, R.J. 1998.** Palynological evidence for Tertiary plant dispersals in the SE Asian region in relation to plate tectonics and climate. *Biogeography and Geological Evolution of SE Asia* (ed. by Hall, R. and Holloway, J.D.), pp. 211–234. Backhuys Publishers, Leiden.
- Morley, R.J. 2000.** *Origin and evolution of tropical rain forests*. John Wiley, New York.
- Morley, R.J. 2007.** Cretaceous and Tertiary climate change and the past distribution of megathermal rainforests. *Tropical rainforest responses to climate changes* (ed. by M.B. Bush and J. Flenley), pp. 1–31. Praxis, Chichester.
- Muellner, A.N., Pannell, C.M., Coleman, A. and Chase, M.W. 2008.** The origin and evolution of Indomalayan, Australasian and Pacific Island biotas: insights from Aglaieae (Meliaceae, Sapindales). *Journal of Biogeography* 35: 1769–1789.
- Nauheimer, L., Boyce, P.C. and Renner, S.S. 2012.** Giant taro and its relatives: a phylogeny of the large genus *Alocasia* (Araceae) sheds light on Miocene floristic exchange in the Malesian region. *Molecular phylogeny and Evolution* 63: 43–51.
- Nylander, J.A., Ronquist, F., Huelsenbeck, J.P. and Nieves-Aldrey, J.L. 2004.** Bayesian phylogenetic analysis of combined data. *Systematic Biology* 53: 47–67.
- Nylander, J.A.A., Olsson, U., Alström, P. and Sanmartín, I. 2008.** Accounting for phylogenetic uncertainty in biogeography: a Bayesian approach to Dispersal–Vicariance Analysis of the thrushes (Aves: Turdus). *Systematic Biology* 57: 257–268.
- Parveen, I., Threadgill, M.D., Moorby, J.M. and Winters, A. 2010.** Oxidative phenols in forage crops containing polyphenol oxidase enzymes. *Journal of Agricultural and Food Chemistry* 58: 1371–2054.
- Phan Kê Lôc and Vidal, J.E. 2001.** *Flore du Cambodge du Laos et du Viêtname* 30. *Leguminosae-Papilionoideae-Millettieae*. Muséum National d'Histoire Naturelle, Paris.

- Pittier, H. 1917.** The middle American species of *Lonchocarpus*. *Contributions from the United States National Herbarium* 20: 37–93.
- Plaziat, J.-C., Cavagnetto, C., Koeniguer, J.-C., and Baltzer, F. 2001.** History and biogeography of the mangrove ecosystem, based on a critical reassessment of the paleontological record. *Wetlands Ecology and Management* 9: 161–179.
- Polhill, R.M. 1971.** Some observations on generic limits in Dalbergieae-Lonchocarpaceae Benth. (Leguminosae). *Kew Bulletin*. 25: 259–273.
- Polhill, R.M. 1981.** Tribe 4. Dalbergieae Bronn ex DC. (1825). In: *Advances in legume systematics*, part 1 (ed. by Polhill, R.M. and Raven, P.H.), pp. 233–252. Royal Botanic Gardens, Kew.
- Polhill, R.M. 1990.** 80 Légumineuses; 24. *Derris* Lour. *Flore des Mascareignes: La Réunion, Maurice, Rodrigues* (ed. by J. Bosser, Th. Cadet, J. Guého and W. Marais), pp. 69–73. Sugar Industry Research Institute, Port Louis, Mauritius; ORSTOM, Paris; Royal Botanic Gardens, Kew.
- Polhill, R.M. 1994.** Classification of the Leguminosae. In: *Phytochemical dictionary of the Leguminosae* (ed. by Bisby, F.A., Buckingham, J. and Harborne, J.B.), pp. xxxv–xlvi. Chapman and Hall, New York.
- Pound, M.J., Haywood, A.M., Salzmann, U. and Riding, J.B. 2012.** Global vegetation dynamics and latitudinal temperature gradients during the mid to Late Miocene (15.97–5.33 Ma). *Earth Science Reviews* 112: 1–22.
- Prain, D. 1897.** Order 8. Leguminosae. *Journal of the Asiatic Society of Bengal* 66: 21–275.
- Prive-Gill, C., Thomas, H. and Leuret, P. 1999.** Fossil wood of *Sindora* (Leguminosae, Caesalpinaceae) from the Oligo-Miocene of Saudi Arabia: paleobiogeographical considerations. *Review of Palaeobotany and Palynology* 107: 191–199.
- Prasad, M., Ghosh, R. and Tripathi P.P. 2004.** Floristics and climate during Siwalik (Middle Miocene) near Kathgodam in the Himalayan foot-hills of Utranchal, India. *Journal of the Palaeontological Society of India* 49: 35–93.
- Queiroz, C., Lopes, M.L.M., Fialho, E. and Valente-Mesquita, V.L. 2008.** Polyphenol Oxidase: Characteristics and Mechanisms of Browning Control. *Food Reviews International* 24: 361–375.

References

- Rambaut, A. and Drummond, A.J. 2007.** Tracer v.1.4. Available from <http://beast.bio.ed.ac.uk/Tracer> (last checked 11 Mar. 2013).
- Rambaut, A. 2009.** FigTree v.1.4. Available from <http://tree.bio.ed.ac.uk/software/figtree/> (last checked 11 Mar. 2013).
- Ree, R.H., Moore, B.R., Webb C.O. and Donoghue, M.J. 2005.** A likelihood framework for inferring the evolution of geographic range on phylogenetic trees. *Evolution* 59: 2299–2311.
- Ree, R.H. and Smith, S.A. 2008.** Maximum likelihood inference of geographic range evolution by dispersal, local extinction, and cladogenesis. *Systematic Biology* 57: 4–14.
- Renner, S.S. 2004.** Multiple Miocene Melastomataceae dispersal between Madagascar, Africa, and India. *Philosophical Transactions of the Royal Society Biological Sciences* 359: 1485–1494.
- Richardson, J.E., Costion, C.M. and Muellner, A.N. 2012.** The Malesian Floristic Interchange: plant migration patterns across Wallace's Line. *Biotic Evolution and Environmental Change in Southeast Asia* (ed. by D. Gower, K. Johnson, J.E. Richardson, B. Rosen, L. Rüber and S. Williams), pp. 138–163. Cambridge University Press, Cambridge.
- Ridder-Numan, J.W.A. and Kornet, D.J. 1994.** A revision of the genus *Kunstleria* (Leguminosae : Papilionoideae). *Blumea* 38: 465–485.
- Ridder-Numan, J.W.A. 1998.** Historical biogeography of *Spatholobus* (Leguminosae-Papilionoideae) and allies in SE Asia. In: *Biogeography and Geological Evolution of SE Asia* (ed. by Hall, R. and Holloway, J.D.), pp. 259–278. Backhuys Publishers, Leiden.
- Ridley, H.N. 1922.** *Flora of the Malay Peninsula* 1. L. Reeve & Co., London, UK.
- Robertson, D.R. and Smith-Vaniz, W.F. 2008.** Rotenone: An essential but demonized tool for assessing marine fish diversity. *BioScience* 58: 165–170.
- Roberty, G. 1954.** Notes sur la flore de l'Ouest-africain. *Bulletin de l'Institut Française d'Afrique Noire*. Série A 16: 321–369.
- Rodríguez-Riario, T., Ortega-Olivencia, A. and Devesa, J.A. 1999.** Type of Androecium in the Fabaceae of SW Europe. *Annals of Botany* 83: 109–116.

- Rögl, F. 1998.** Palaeogeographic considerations for Mediterranean and Paratethys seaways (Oligocene to Miocene). *Annalen des Naturhistorischen Museums in Wien* 99: 279–310.
- Rögl, F. 1999.** Circum-Mediterranean Miocene paleogeography. *The Miocene land mammals of Europe* (ed. by G. Rössner and K. Heissig), pp. 39–48. Dr. Fritz Pfeil Verlag, Munich.
- Ronquist, F. 1997.** Dispersal-Vicariance Analysis: A New Approach to the Quantification of Historical Biogeography. *Systematic Biology* 46: 195–203.
- Ronquist, F., and Huelsenbeck, J.P. 2003.** Mr Bayes 3: Bayesian phylogenetic inference under mixed models. *Bioinformatics* 19: 1572–1574.
- Rudd, V.E. 1991.** Fabaceae (Leguminosae). In: *A Revised Hand Book to the Flora of Ceylon*, vol. 7 (ed. by Dassanayake, M.D. and Fosberg, F.R.), pp. 34–381. Amerind Publishing Co. Pvt. Ltd., New Delhi.
- Samonds, K.E., Godfrey, L.R., Ali, J.R., Goodman, S.M., Vences, M., Sutherland, M.R., Irwin, M.T. and Krause, D.W. 2012.** Spatial and temporal arrival patterns of Madagascar’s vertebrate fauna explained by distance, ocean currents, and ancestor type. *Proceedings of the National Academy of Sciences of the United States of America* 109 (14): 5352–5357.
- Sang, T., Crawford, D. and Stuessy, T. 1997.** Chloroplast DNA phylogeny, reticulate evolution, and biogeography of *Paeonia* (Paeoniaceae). *American Journal of Botany* 84: 1120–1136.
- Schot, A.M. 1991.** Phylogenetic relations and historical biogeography of *Fordia* and *Imbralyx* (Papilionaceae: Millettieae). *Blumea* 36: 205–234.
- Schrire, B.D. 2000.** A synopsis of the genus *Philenoptera* (Leguminosae-. Millettieae) from Africa and Madagascar. *Kew Bulletin* 55: 81–94.
- Schrire, B.D. 2005.** Tribe Millettieae. *Legumes of the world* (ed. by Lewis, G., Schrire, B.D., Mackinder, B. and Lock, M.), pp. 367–387. Royal Botanic Gardens, Kew.
- Schrire, B.D., Levin, M., Barker, N.P. and Forest, F. 2009.** Phylogeny of the tribe Indigoferae (Leguminosae-Papilionoideae): Geographically structured more in succulent-rich and temperate settings than in grass-rich environments. *American Journal of Botany* 96: 816–852.
- Scotland, R.W., Olmstead, R.G. and Bennett, J.R. 2003.** Phylogeny Reconstruction: The Role of Morphology. *Systematic Biology* 52: 539–548.

References

- Sierra, S.E.C., Kulju, K.K.M., Fišer, Ž., Aparicio, M., van Welzen, P.C. 2010.** The phylogeny of *Mallotus* s.s. (Euphorbiaceae s.s.) inferred from DNA sequence and morphological data. *Taxon* 59: 101–116.
- Simmons, M.P. and Ochoterena, H. 2000.** Gaps as Characters in Sequence-Based Phylogenetic Analyses. *Systematic Biology* 49: 369–81.
- Singh, G. 2006.** *Plant Systematics: An Integrated Approach*. Science Publisher Inc. Enfield, New Hampshire.
- Sirichamorn, Y., Adema, F.A.C.B. and van Welzen, P.C. 2012a.** The Genera *Aganope*, *Derris* and *Paraderris* (Fabaceae, Millettieae) in Thailand. *Systematic Botany* 37: 404–436.
- Sirichamorn, Y., Adema, F.A.C.B., Gravendeel, B. and van Welzen, P.C. 2012b.** Phylogeny of palaeotropic *Derris*-like taxa (Fabaceae) based on chloroplast and nuclear DNA sequences shows reorganization of (infra)generic classifications is needed. *American Journal of Botany* 99: 1793–1808.
- Sirichamorn, Y., Adema, F.A.C.B. and van Welzen, P.C. 2013.** (2121) Proposal to conserve the name *Brachypterum* against *Solori* (Fabaceae). *Taxon* 62: 179–180.
- Stirton, C.H. 1981.** Petal Sculpturing in Papilionoid Legumes. In: *Advances in Legume Systematics*, part 1 (ed. by Polhill, R.M. and Raven, P.H.), pp. 771–788. Royal Botanical Gardens, Kew.
- Su, Y.C.F. and Saunders, R.M.K. 2009.** Evolutionary divergence times in the Annonaceae: evidence of a late Miocene origin of *Pseuduvaria* in Sundaland with subsequent diversification in New Guinea. *BMC Evolutionary Biology* 9: article no.153.
- Suzuki, Y., Glazko, G.V. and Nei, M. 2002.** Over credibility of molecular phylogenies obtained by Bayesian phylogenetics. *Proceedings of the National Academy of Sciences, USA* 99: 16138–16143.
- Swofford, D.L. 2003.** PAUP*. Phylogenetic analysis using parsimony (*and other methods), version 4.ob10. Sinauer, Sunderland, Massachusetts.
- Systematic Agenda 2000:** Charting the Biosphere. Technical Report. Herbarium, New York Botanical Garden, New York.
- Taubert, P. 1891.** Leguminosae. In: *Die natürlichen Pflanzenfamilien* III (ed. by Engler, A. and Prantl, K.), pp. 70–388. Engelmann, Leipzig.

- Taberlet, P., Gielly, L., Pantou, G., and Bouvet, J. 1991.** Universal primers for amplification on three non-coding regions of chloroplast DNA. *Plant Molecular Biology*. 17: 1105–1109.
- Tewari. R.B. and Nair, P.K.K. 1987.** Morphology of spurs in some Papilionaceae. *New Botanist* 5: 103–108.
- Thomas, D.C., Hughes, M., Phutthai, T., Ardi, W.H., Rajbhandary, S., Rubite, R., Twyford, A.D., and Richardson, J.E. 2012.** West to east dispersal and subsequent rapid diversification of the mega-diverse genus *Begonia* (Begoniaceae) in the Malesian archipelago. *Journal of Biogeography* 39: 98–113.
- Thompson, J.D., Higgins, D., and Gibson, T.J. 1994.** CLUSTAL W: improving the sensitivity of progressive multiple sequences alignment through sequence weighting, position-specific gap penalties and weight matrix choice. *Nucleic Acids Research* 22: 4673–4680.
- Thothathri, K. 1961.** Studies in Leguminosae 1. A taxonomic revision of the genus *Derris* Lour. in India. *Bulletin of the Botanical Survey of India* 3: 175–200.
- Thothathri, K. 1982.** Leguminosae: Genus *Derris*. *Fascicles of Flora of India* 8: 1–33.
- Thothathri, K. and Rugayah. 1997.** *Derris microphylla* (Miq.) B.D.Jacks. In: *PROSEA: Plant Resources of South-East Asia* 11 (Auxiliary Plants) (ed. by Hanum, F. and van der Maesen, L.J.G.), pp. 115–117. Backhuys Publisher, Leiden.
- Thwaites, G.H.K. 1864.** 51. *Brachypterum*, Benth. In: *Enumeratio Plantarum Zeylaniae*, pp. 93. Dulau & Co., London.
- Torke B.M. and Schaal, B.A. 2008.** Molecular phylogenetics of the species-rich neotropical genus *Swartzia* (Leguminosae, Papilionoideae) and related genera of the swartzoid clade. *American Journal of Botany* 95: 215–228.
- Toxopeus, H.J. 1952a.** Studies in the breeding of *Derris elliptica* and *Derris malaccensis*, 1. Variation and the origin of the cultivated material. *Euphytica* 1: 34–42.
- Toxopeus, H.J. 1952b.** Studies in the breeding of *Derris elliptica* and *Derris malaccensis*, 2. Crossbreeding, cytological observations, genetic system. *Euphytica* 1: 175–183.
- Tozzi, A.M.G.A. 1994.** Espécies novas de *Deguelia* Aubl. (Leguminosae–Papilionoideae–Millettieae). *Revista Brasileira de Botânica* 17: 45–52.

References

- Tucker, S.C. 1987a.** Floral initiation and development in legumes. In: *Advances in Legume Systematics*, part 3 (ed. by Stirton, C.H.), pp. 183–239. Royal Botanic Gardens, Kew.
- Tucker, S.C. 1987b.** Pseudoracemes in papilionoid legumes: their nature, development, and variation. *Botanical Journal of Linnean Society* 95: 181–206.
- Tucker, S.C. 1989.** Evolutionary implications of floral ontogeny in legumes. In: *Advances in Legume Biology. Monographs in Systematic Botany from the Missouri Botanical Garden* 29 (ed. by Stirton, C.H. and Zarucchi, J.L.), pp. 59–75. St. Louis: Missouri Botanical Garden.
- Turner, I.M. 2001.** Leaf development: coloured young leaves. In: *The ecology of trees in the tropical rain forest* (ed. by Ashton, P.S, Hubbell, S.P., Janzen, D.H., Raven, P.H. and Tomlinson, P.B.), pp. 83–86. Cambridge Tropical Biology Series. Cambridge University Press, Cambridge.
- Van Hinsbergen, D.J.J., Lippert, P.C., Dupont-Nivet, G., McQuarrie, N., Doubrivine, P.V., Spakman, W. and Torsvik, T.H. 2012.** Greater India Basin hypothesis and a two-stage Cenozoic collision between India and Asia. *Proceedings of the National Academy of Sciences of the United States of America* 109: 7659–7664.
- Van Rheede tot Draakestein, H.A. 1686.** Hortus Indicus Malabaricus 6: T.22 J. van Someren and van Dijck, J. Amsterdam.
- Van Rheede tot Draakestein, H.A. 1688.** Hortus Indicus Malabaricus 8: T.46 J. van Someren and van Dijck, J. Amsterdam.
- Van Steenis, C.G.G.J. 1957.** Specific and intraspecific delimitation. In: *Flora Malesiana* ser. 1, 5 (ed. by van Steenis, C.G.G.J.), pp. 167–234. Noordhoff-Kolff N.V., Jakarta.
- Wahlberg, N., Braby, M.F. Brower A.V.Z., de Jong, R., Lee, M.M., Nylin, S., Pierce, N.E., Sperling, F.A.H., Vila, R., Warren, A.D. and Zakharov, E. 2005.** Synergistic effects of combining morphological and molecular data in resolving the phylogeny of butterflies and skippers. *Proceedings of the Royal Society of London Series B Biological Sciences* 272: 1577–1586.
- Warren, B.H., Strasberg, D., Bruggemann, J.H., Prys-Jones, R.P. and Thébaud, C. 2010.** Why does the biota of the Madagascar region have such a strong Asiatic flavour? *Cladistics* 26: 526–538.

- Wei, Z., Chen, D., Zhang, D. and Pedley, L. 2008.** Fabaceae tribe Millettieae. In: *Flora of China*, vol. 10 (ed. by Wu, Z.Y., Raven, P.H. and Hong, D.Y.), pp. 165–193. Science Press, Beijing.
- Wendel, J.F. and Doyle, J.J. 1998.** Phylogenetic incongruence: Window into genome history and molecular evolution. In: *Molecular Systematics of Plants 2* (ed. by Soltis, D.E., Soltis, P.S. and Doyle, J.J.), pp. 265–296. Kluwer Academic Publishers, Dordrecht.
- White, T.J., Bruns, T., Lee, S. and Taylor, J. 1990.** Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: *PCR protocol: a guild to methods and applications* (ed. by Innes, M., Gelfand, D., Sninsky, J. and White, T.J.), pp. 315–322. Academic Press, San Diego.
- Whybrow, P.J. and McClure, H.A. 1981.** Fossil mangrove roots and paleoenvironments of the Miocene of the eastern Arabian Peninsula. *Palaeogeography, Palaeoclimatology, Palaeoecology* 32: 213–225.
- Wiens, J.J. 2004.** The role of morphological data in phylogeny reconstruction. *Systematic Biology* 53: 653–661.
- Wight, R. and Arnott, G.A.W. 1834.** *Prodromus Florae Peninsulae Indiae Orientalis*: 264. Parbury, Allen, & Co., London.
- Wojciechowski, M.F., Sanderson, M.J., Baldwin, B.G. and Donoghue, M.J. 1993.** Monophyly of aneuploid *Astragalus* (Fabaceae). Evidence from nuclear ribosomal DNA internal transcribed spacer sequences. *American Journal of Botany* 80: 711–722.
- Wojciechowski, M.F., Sanderson, M.J. and Hu, J.-M. 1999.** Evidence on the monophyly of *Astragalus* (Fabaceae) and its major subgroups based on nuclear ribosomal DNA ITS and chloroplast DNA *trnL* intron data. *Systematic Botany* 24: 409–437.
- Wojciechowski, M.F. 2003.** Reconstructing the phylogeny of the legumes (Leguminosae): an early 21st century perspective. In: *Advances in Legume Systematics*, part 10 (ed. by Klitgaard, B.B. and Bruneau, A.), pp. 5–35. Royal Botanic Gardens, Kew.
- Wolfe, J.A. 1975.** Some aspects of plant geography of the Northern Hemisphere during the Late Cretaceous and Tertiary. *Annals of the Missouri Botanical Garden* 62: 264–279.

References

- Wortley, A.H. and Scotland, R.W. 2006.** The effect of combining molecular and morphological data in published phylogenetic analyses. *Systematic Biology* 55: 677–685.
- Yu, Y., Harris, A.J. and He, X.-J. 2010.** S-DIVA (Statistical Dispersal-Vicariance Analysis): a tool for inferring biogeographic histories. *Molecular Phylogenetics and Evolution* 56: 848–850.
- Yu, Y., Harris, A.J. and He, X.-J. 2013.** RASP (Reconstruct Ancestral State in Phylogenies) 2.1 beta. Available from <http://mnh.scu.edu.cn/soft/blog/RASP> (last checked 11 Mar. 2013).
- Yue, X.-K., Yue, J.-P., Yang, L.-E., Li, Z.-M. and Sun, H. 2011.** Systematics of the genus *Salweenia* (Leguminosae) from Southwest China with discovery of a second species. *Taxon* 60: 1366–1374.
- Zachos, J., Pagani, M., Sloan, L., Thomas, E. and Billups, K. 2001.** Trends, rhythms, and aberration in global climate 65 Ma to present. *Science* 292: 686–693.
- Zhou, L., Su, Y.C.F., Thomas D.C. and Saunders, R.M.K. 2012.** ‘Out-of-Africa’ dispersal of tropical floras during the Miocene climatic optimum: evidence from *Uvaria* (Annonaceae). *Journal of Biogeography* 39: 322–335.

Curriculum Vitae

Yotsawate Sirichamorn was born on 18 October 1981 in Chon Buri province, Thailand. He finished his secondary education at Traim Udom Suksa School, Bangkok, in 2000. He studied at Chulalongkorn University, Bangkok, and obtained his Bachelor degree of Sciences, and received first class honors in the field of Botany in 2004 and then a Master of Sciences degree in the same field of study in 2007. Yotsawate has been interested in biodiversity, especially in plant diversity, since he was very young. During his study at Chulalongkorn University, he was granted a scholarship of the Development and Promotion of Science and Technology Talents (DPST) project. Yotsawate chose systematic botany as his major. During his Master study, Yotsawate gained his first work experience as a teaching assistant in many botanical subjects for Bachelor-degree students, for example, Plant taxonomy, Plant morphology, Economic plants and Plants for better life. He also participated in the “Little Botanist” project for primary school students, organized by Chulalongkorn University Demonstration Elementary School. Yotsawate received the Academic Excellence Award for the outstanding science student in Botany from the Professor Dr. Tab Nilanidhi Foundation in 2007. After his Masters degree, he worked as a research assistant at Professor Kasin Suwattapan Herbarium, Department of Botany, Chulalongkorn University for a year. His interest in Leguminosae and pteridophytes was inspired by Prof. Dr. Thaweesakdi Boonkerd, who was his first thesis supervisor. In 2008, Yotsawate was granted a scholarship for biodiversity studies by the Thailand office of the Higher Education Commission. He started his Ph.D at the National Herbarium of the Netherlands, Leiden University, under the supervision of Prof. Dr. Peter C. van Welzen and Dr. Frits A.C.B. Adema. During his study in Leiden University he assisted in the Tropical Plant Families course for MSc students and also gave lectures on the plant families Burseraceae, Lamiaceae and Myrtaceae. After his graduation he will continue his career as a lecturer at the department of Biology, Faculty of Sciences, Silpakorn University, Sanamchandra Palace Campus, Nakhon Pathom province, Thailand.

List of publications

- Sirichamorn, Y.**, Adema, F.A.C.B. and van Welzen, P.C. 2012. The Genera *Aganope*, *Derris* and *Paraderris* (Fabaceae, Millettieae) in Thailand. *Systematic Botany* 37: 404–436.
- Sirichamorn, Y.**, Adema, F.A.C.B., Gravendeel, B. and van Welzen, P.C. 2012. Phylogeny of palaeotropic *Derris*-like taxa (Fabaceae) based on chloroplast and nuclear DNA sequences shows reorganization of (infra)generic classifications is needed. *American Journal of Botany* 99: 1793–1808.
- Sirichamorn, Y.**, Adema, F.A.C.B. and van Welzen, P.C. 2013. (2121) Proposal to conserve the name *Brachypterum* against *Solori* (Fabaceae). *Taxon* 62: 179–180.

Acknowledgements

I would like to express my gratitude to the Office of the Higher Education Commission and Royal Thai Government for the financial support of my research.

During my fieldwork I was assisted by Dr. Winai Somprasong, head of Bangkok Herbarium, Bob Harwood, Yutthana Tongboonkuea and Dr. Charan Leeratiwong. My sincere thanks are extended to all staffs and curators of BCU, BK, BKF, CMU, K, L, P and WAG for providing laboratory facilities, specimen loans, and various kinds of support. I like to mention Anita Walsmit Sachs for her beautiful illustrations; Marcel Eurlings for his molecular lab training; Natasha Schildo, René Glas and all technicians at the Sylvius Laboratory for assistance; Brigitta Duijfjes and Willem de Wilde, my aunt and uncle abroad, for their kindness, hospitality and much help.

Many thanks go to my Thai and foreign friends from Naturalis and other institutions: Kanchana Pruesapan, Piya Temviriyankul, Tanawat Chaowasku, Marc Appelhans, Svenja Meinke, Dome and Saranyapin Potikanond, Bhanumas Chantarasuwan, Narongsak Kidsom, Naovarat van Welzen, Sungwan Klaassen, Nor Yahaya, Annick Lang, Judith Aiglsperger, Constantijn Mennes, Rodrigo Cámara, Nicolas Davin, Patrick Henriksson and Mega Atria.

I gratefully acknowledge Prof.dr. Thaweesakdi Boonkerd, my first supervisor in Thailand, who raised my interest in taxonomic studies of legumes, and Dr. Tosak Seelanan, my first teacher in molecular phylogenetics and lab works. I am grateful to Dr. Hu Jer-Ming for his very informative work on the molecular systematics of the Millettieae.

I like to express my deepest gratitude to my parents and younger sister for all the support, love, understanding and encouragement they have given me.

Finally, I like to dedicate this thesis to the memory of Dr. Robert (Rob) Geesink (1945-1992), who devoted himself to the study of the complex leguminous tribe, the Millettieae. His publications provide valuable information for all legume taxonomists for many generations to come.