Plant turnover in response to climate change in the Cenozoic: Palynological insights from Myanmar, Southeast Asia and beyond

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AUTHOR CONTRIBUTIONS
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Chapter 2 “At a crossroads: the late Eocene flora of central Myanmar owes its composition to plate collision and tropical climate”


Review of Palaeobotany and Palynology, in revision.

H.H., R.J.M. and C.H. conceived and designed the research; A.L., Z.W., D.W.A. and G.D.-N. led the fieldwork with contributions from D.P.-P. and H.H.; H.H. acquired and analyzed data with contribution from R.J.M.; D.P.-P. collected and analyzed Sapotaceae data with contribution from H.H.; A.P. tested methods and processed the samples; H.H. led the writing with major contributions from D.P.-P., R.J.M. and C.H.; All authors revised and approved the manuscript.

Chapter 3 “Late Eocene vegetation and environmental dynamics under monsoonal climate in central Myanmar”


In preparation.

H.H., R.J.M. and C.H. conceived and designed the research; A.L., Z.W., D.W.A. and G.D.-N. led the fieldwork with contributions from D.P.-P. and H.H.; H.H. led data acquisition and analysis with contribution from R.J.M.; E.B.L., G.N.A. and R.K.S. contributed with data on plant diversity; H.H. led the writing with major contributions from R.J.M. and C.H.; all authors revised and approved the manuscript.

Chapter 4 “Eocene palms from central Myanmar in a SE Asian and global perspective: Evidence from the palynological record”

Huasheng Huang, Robert Morley, Alexis Licht, Guillaume Dupont-Nivet, Friðgeir Grimsson, Reinhard Zetter, Jan Westerweel, Zaw Win, Day Wa Aung & Carina Hoorn


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AUTHOR CONTRIBUTIONS

H.H., R.M. and C.H. conceived and designed the research; A.L., Z.W., D.W.A. and G.D.-N. led the fieldwork with contributions from D.P.-P. and H.H.; F.G. and R.Z. facilitated microscopy facilities for pollen identification and microphotography; H.H. led data acquisition and analysis; H.H. led the writing with major contributions from R.M. and C.H.; all authors revised and approved the manuscript.

Chapter 5 “Climate and geological change as drivers of Mauritiinae palm biogeography”
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Chapter 6 “Diversity declines and range contraction of palms through the Cenozoic”
In preparation.

J.Y.L., H.H. and C.H. conceived and designed the research; H.H. collected fossil data; A.F. and D.J.L. contributed with paleoclimate and paleolocation data; J.Y.L. analyzed data; J.Y.L. led the writing with contributions from all authors; all authors revised and approved the manuscript; J.Y.L. and H.H. contributed equally to the manuscript.
“There is no need for a time machine in order to travel back through time – all you need is a good microscope, some patience, a little imagination, and some carefully chosen rock samples…”, said by Robert Morley in 2000. Thanks to funding from the CSC and IBED, I succeeded in traveling back throughout the Cenozoic (around 66 million years ago to present) with pollen fossil record and explore how vegetation, palm diversification and biogeography, and environment responded to climate change, particularly in the late Eocene (around 37 million years ago) of Myanmar. However, the ‘travel’ process was not always smooth, especially for a novice on palynology, who did paleobotany during his master’s. As an proverb says, “If you want to go fast, go alone; if you want to go far, go together”, I could have never completed this thesis, without the kind support from my (co)promotores, colleagues, friends, and family and relatives.

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CURRICULUM VITAE
Huasheng Huang (黄华生) was born on December 26th, 1990 in Zhanjiang City, Guangdong Province, People's Republic of China. He grew up in Lemin, a seaside town of Leizhou Peninsula, along the Beibu Gulf (also termed “Gulf of Tonkin”), which is located off the coasts of North Vietnam and South China. In June 2013, he obtained his bachelor’s degree in horticulture advised by Prof. Zhenxian Wu from the South China Agriculture University in Guangzhou, with a thesis focusing on the effect of sulphur dioxide fumigation on post-harvest physiology and quality of longan fruit (*Dimocarpus longan* in the soapberry family Sapindaceae) stored at low temperature. Subsequently he joined the Paleoecology Research Group at the Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, supervised by Prof. Zhekun Zhou (the first year by Dr. Frédéric Jacques), and worked on cuticles of fossil leaves to identify taxa and reconstruct paleo-CO$_2$ levels. In June 2016, he got his master's degree in paleobotany, and published two papers (with two new species: *Quercus heqingensis* and *Buxus pliosinica*) on fossil leaves found in the upper Pliocene sediments from Heqing County, Yunnan Province, Southwest China. Afterwards in October, he was granted a scholarship from the China Scholarship Council (CSC, No. 201604910677) and started his PhD project at the Department of Ecosystem & Landscape Dynamics (ELD), Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam (UvA), mainly under the supervisions of Drs. Carina Hoorn (UvA) and Robert Morley (Palynova Ltd, Littleport, UK). Since then, he is a member of the Myanmar Paleoclimate and Geodynamics Research (MyaPGR) group, founded in 2016 winter and led by Dr. Alexis Licht (CEREGE, France), which focuses on the evolution of central Myanmar. He also has membership of the Botanical Society of America, International Biogeography Society, the European Palm Society, and Palynologische Kring. He has extensive paleobotanical and palynological fieldwork experience in the areas including Southwest China, Tibet, and Myanmar. He is interested in unravelling the relation between vegetation, environment and climate in the deep time of Southeast Asia and China, and evolutionary history and global biogeography of plants, particularly palms. Read more at his personal website: https://huashenghuang.weebly.com.
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