



Title	Historical biogeography of Asimina-Dissepalum (Annonaceae): origins of tropical intercontinental disjunctions and diversifications in Southeast Asia
Author(s)	Li, PS; Thomas, DC; Saunders, RMK
Citation	The 51st Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2014), Cairns, Australia, 20-24 July 2014.
Issued Date	2014
URL	http://hdl.handle.net/10722/205046
Rights	Creative Commons: Attribution 3.0 Hong Kong License

HISTORICAL BIOGEOGRAPHY OF *ASIMINA-DISEPALUM* (ANNONACEAE):
ORIGINS OF TROPICAL INTERCONTINENTAL DISJUNCTIONS AND
DIVERSIFICATIONS IN SOUTHEAST ASIA

Pui-Sze Li¹, Daniel C. Thomas² and Richard M. K. Saunders¹

¹ School of Biological Sciences, The University of Hong Kong, Pokfulam Road, Hong Kong, P. R. China (izpuisze@hku.hk); ² Netherlands Centre for Biodiversity Naturalis, section Botany, Leiden University, P.O. Box 9514, 2300 RA Leiden, the Netherlands.

Studies of tropical intercontinental disjunctions, common biogeographical patterns in flowering plants, enable insights into the origin of extant distributions and diversity patterns. We investigate the temporal origin of the Neotropical-Asian disjunction in the *Asimina-Disepalum* clade of the early-divergent angiosperm family Annonaceae, and temporal congruence with underlying palaeoclimatic and geological processes. Moreover, we aim to identify the geographical origin of *Disepalum*, and to infer dispersal and vicariance events as well as potentially correlated climate niche differentiation in the evolution of the genus in Southeast Asia.

Divergence times in the *Asimina-Disepalum* clade are estimated using a fossil-calibrated Bayesian uncorrelated lognormal (UCLD) relaxed molecular clock. Ancestral area reconstructions are performed using statistical dispersal-vicariance analysis (S-DIVA) and a likelihood approach implementing the dispersal-extinction-cladogenesis (DEC) model. Ecological niche modeling is used to evaluate climate niche similarity among species, and to reconstruct the ancestral climatic preferences of individual clades.

Divergence time estimates indicate that the origin of the Neotropical-Asian disjunction in the *Asimina-Disepalum* clade is temporally congruent with the disruption of boreotropical forests during the late Eocene and Oligocene. A Malesian origin is inferred for *Disepalum*, which forms two main clades, one of which is restricted to montane forests in continental Asia, whereas the other occurs in lowland forests in western Malesia. During the rise in global temperatures from the late Oligocene to the Mid-Miocene, some lineages dispersed into higher latitudes and altitudes to occupy montane forests in continental Asia (and Peninsula Malaysia and Sumatra), whilst others adapted to warmer lowland forests in Malesia.