

Figs of Lambir Hills, Sarawak: Overview of a diverse plant assemblage

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ABSTRACT

Figs are one of the most important plant genera in tropical forests and are remarkable for the diversity of species that co-exist. Indeed throughout the tropics they are often the most diverse genus of dicotyledonous plants, and assemblages are particularly rich in the Asian region. At Lambir Hills over 80 species co-exist. Figs are also known for their unique pollination system in which tiny seed predator-pollinator wasps raise their offspring in the fig inflorescence. Figs and their pollinators have co-evolved for at least 80 million years. Moreover, the pollinators co-exist with a taxonomically diverse suite of non-pollinating fig wasps, including competitors and parasitoids, which together can form assemblages of over 20 species per fig host. Finally, to conservation biologists figs are renowned for the importance of their fruit to wildlife. Over 1200 species of vertebrate eat figs globally, and locally the proportion of bird and mammal assemblages feeding on figs varies from 15% to over 30%. Thus, understanding the evolutionary and ecological factors underlying the diversity of figs may lead us to a better appreciation of the diversity of life, especially in tropical forests. I provide a brief synopsis of the fig assemblage at Lambir Hill with respect to life-form, density, distribution, phenology, and seed dispersal. Figs in different sections of the genus have very divergent ecologies. For example, while monoecious hemi-epiphytic figs have low density and scattered distributions, flower infrequently, and have diverse frugivore assemblages, some dioecious figs are pioneers that occur at high densities, flower more frequently and have fewer seed dispersers. I will then focus on the monoecious hemi-epiphytic figs, often erroneously known as “Stranglers”, which is a particular species-rich group of closely related species. I will describe niche differentiation among species with respect to colonisation environment, phenology, and dispersal behaviour of their pollinators. Separate guilds occupy emergent, canopy, and understorey hosts. Species found higher in the canopy have larger inflorescences, flower less frequently, and their pollinators fly higher above the canopy, compared to species found lower in the canopy. These results illustrate the evolutionary diversification of figs and how the intricate mutualism with their pollinator has both contributed to and constrained their evolution.

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Rhett Harrison is an Associate Researcher at the Smithsonian Tropical Research Institute and is currently conducting research at various institutions in SE Asia. He received an Honours degree from the University of Durham, UK, and his MSc and PhD from Kyoto University, Japan. He was a JSPS fellow at the Center for Ecological Research, Kyoto University, a Smithsonian Institute fellow at the Smithsonian Tropical Research Institute, Panama and most recently a visiting researcher at the Institute for Humanity and Nature, Japan. He has over 20 publications in peer reviewed journals, including Figs and the diversity of tropical rain forests. *Bioscience* **55**: 1053-1065; Dispersal of fig pollinators in Asian tropical forests. *Journal of Tropical Ecology* *in press*. Repercussions of El Niño: Drought causes extinction and the breakdown of mutualism in Borneo. *Proceedings of the Royal Society B* **267**:911-915. rhett_d_harrison@yahoo.co.uk