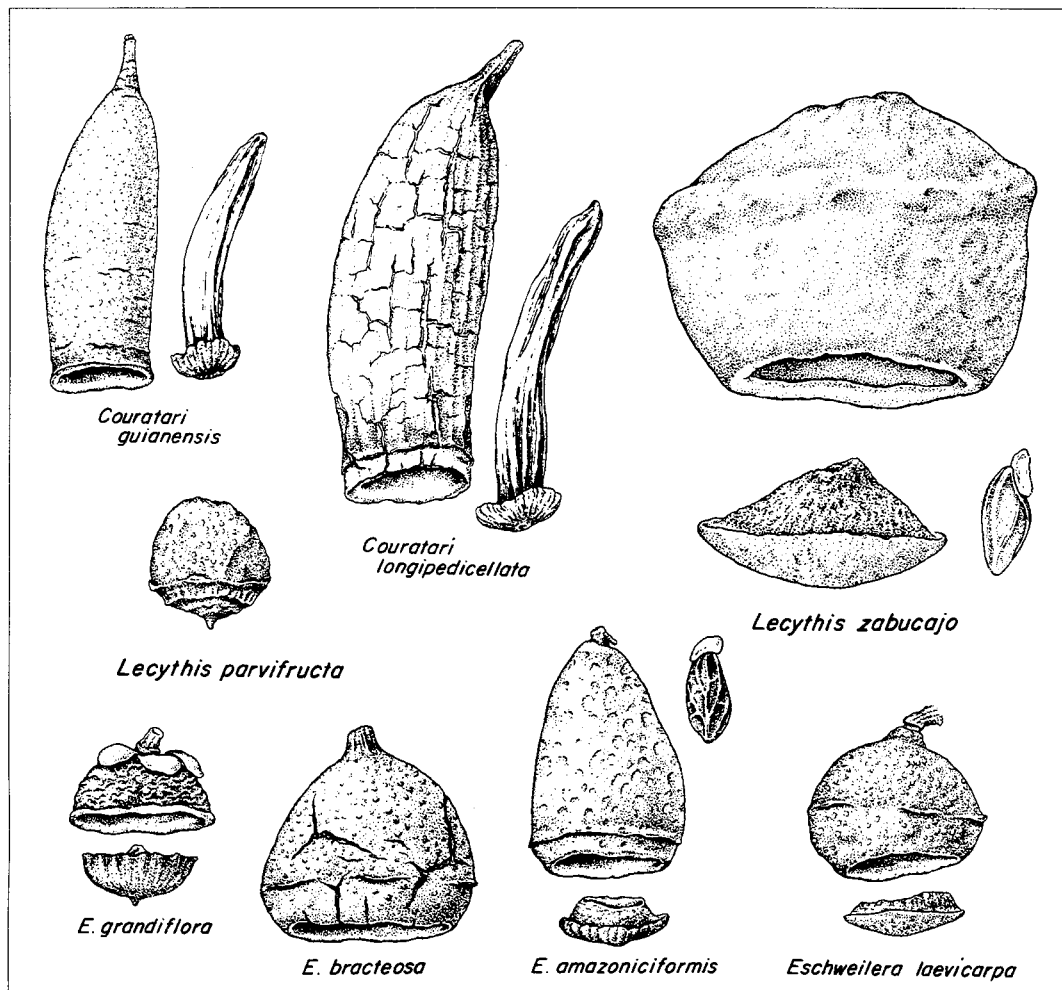


# The Lecythidaceae of a Central Amazonian Moist Forest

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## Abstract

Mori, Scott A. (Institute of Systematic Botany, The New York Botanical Garden, Bronx, New York 10458-5126, U.S.A.) and Nadja Lepsch-Cunha (Dept. de Ciências-Lab. de Sementes, Escola Superior de Agricultura Luiz de Queiroz, 13418-900—Piracicaba—São Paulo, Brazil). The Lecythidaceae of a central Amazonian moist forest. Mem. New York Bot. Gard. 75: 1–55. 1995. The results of a taxonomic study of the 39 species of the Brazil nut family (Lecythidaceae) found in the 1000-ha control reserve (Reserve 1501 or “Km 41”) of the Biological Dynamics of Forest Fragments Project of the Smithsonian Institution and the Instituto Nacional de Pesquisas da Amazônia are reported. Descriptions, keys, habitat preferences, phenology, distribution and representative specimens, common names (when available), and comments are provided for all species found in the reserve. An illustration of at least one species in each genus is included, and discussions and illustrations of features useful in distinguishing central Amazonian species of Lecythidaceae are presented. Three new species, *Eschweilera rankiniae*, *E. romeu-cardosoi*, and *Lecythis gracieana*, are described. Keys for identification of the genera and species within genera are provided in Portuguese as well as English.

## Resumo

Mori, Scott A. (Institute of Systematic Botany, The New York Botanical Garden, Bronx, New York 10458-5126, U.S.A.) e Nadja Lepsch-Cunha (Dept. de Ciências-Lab. de Sementes, Escola Superior de Agricultura Luiz de Queiroz, 13418-900—Piracicaba—São Paulo, Brasil). The Lecythidaceae of a central Amazonian moist forest. Mem. New York Bot. Gard. 75:1–55. 1995. Os resultados de um estudo taxonômico das 39 espécies da família de Castanha-do-Pará (Lecythidaceae) que ocorrem numa reserva controle de 1.000 ha (Reserva 1501 ou “Km 41”) do Projeto Dinâmica Biológica de Fragmentos Florestais são reportados. Descrições, chaves, preferências ecológicas, distribuição e espécimes representativos, fenologia, nomes vulgares, e comentários sobre cada espécie que se encontra na reserva são apresentados. Incluem-se comentários gerais das características que são empregadas na identificação de gêneros e espécies de Lecythidaceae e, pelo menos, um desenho de uma espécie em cada gênero. Três novas espécies, *Eschweilera rankiniae*, *E. romeu-cardosoi*, e *Lecythis gracieana* são descritas. Chaves para a identificação de gêneros e espécies em Inglês bem como em Português são apresentadas.

## Introduction

Our central Amazonian study of Lecythidaceae is part of the much larger Biological Dynamics of Forest Fragments Project (BDFFP) of the Smithsonian Institution and the Instituto Nacional de Pesquisas da Amazônia (INPA). The BDFF Project was previously known as the Minimum Critical Size of Ecosystems Project under the aegis of the World Wildlife Fund and INPA. A description of the BDFF Project is provided by Lovejoy and Bierregaard (1990).

The principal goal of the BDFF Project is to assess the effects of fragmentation on once continuous tropical rain forest. However, as stated in a call for proposals dated 16 October 1990, "Understanding the relative impact of the forest fragmentation processes requires as background data detailed inventories, knowledge of species biology, and understanding of the abiotic environment within continuous forest."

The Lecythidaceae Sub-Project of the BDFF Project is an attempt to provide the basic biological information needed for understanding the effects of forest fragmentation on one of the ecologically most important families of trees throughout Amazonia and the Guianas (Mori, 1990; Mori & collaborators, 1987; Mori & Prance, 1990a; Prance & Mori, 1979). The specific goals of our work are to (1) reach an understanding of the taxonomy of all species of central Amazonian Lecythidaceae, (2) determine what ecological parameters (topography, past history such as burning and flooding, edaphic factors, phenology, intrafamilial interactions, interfamilial interactions, and interactions with animals) influence the distribution of species of Lecythidaceae, (3) determine minimum population sizes necessary for the continued survival of central Amazonian Lecythidaceae (i.e., where will reserves have to be placed and how big will they have to be), and (4) establish a protocol for sampling Lecythidaceae and, by extrapolation, other neotropical trees.

The Lecythidaceae Sub-Project began in 1987, when Peter Becker (ecologist) approached Mori (taxonomist) about collaboration. Becker was interested in the dynamics of tropical forests and therefore was looking for a family of tropical trees that met three criteria: high diversity, high density, and relatively well-known taxonomy. On the other hand, Mori, who had just finished a taxonomic and ecological study of Lecythidaceae in central French Guiana (Mori & collaborators, 1987), was looking to expand his studies of Lecythidaceae into Amazonia, especially central Amazonia, where diversity of Lecythidaceae is high and where there are numerous taxonomic problems

yet to be solved. Mori is convinced that the best way to resolve taxonomic problems in neotropical trees is to couple taxonomic and ecological studies. Study of herbarium specimens alone sometimes is not sufficient for detecting the nuances of differences among closely related species of tropical trees.

Reserve 1501, also known as Km 41, was selected for our study because it is the 1000-ha control reserve of the BDFF Project. The first digit of the reserve indicates the ranch upon which the reserve is located (1 = Fazenda Esteio), the second digit indicates the size class of the reserve (5 = control area), and the last two digits indicate the number of replicates of that particular size in the BDFF Project (there is only one control area). Reserve 1501 is also called Km 41 because it is located 41 kilometers along state highway ZF-3 from federal highway BR-174 (the Manaus-Boa Vista Highway). A map of Reserve 1501, as well as of all other reserves in the BDFFP system, is provided by Lovejoy and Bierregaard (1990).

Establishment of the Lecythidaceae Sub-Project consisted of (1) location of a 100-ha plot and its subdivision into hectares, which in turn were divided into 20 × 20 m quadrats by a professional surveyor; (2) location and tagging of all individuals of Lecythidaceae equal to or greater than 10 cm dbh; (3) mapping of the individuals of Lecythidaceae; (4) identification to species of the 7791 individuals of Lecythidaceae; (5) collection of data on topography and soils; and (6) entry of biotic and abiotic data into a database.

The Lecythidaceae plot is available for use by other researchers. Studies of Sapotaceae (by T. D. Pennington) and palms (by A. Henderson and A. Scariot) are under way. We encourage others interested in the diversity and structure of neotropical forests to submit research proposals to the BDFF Project in which the infrastructure of the Lecythidaceae plot is utilized.

The purpose of this paper is to provide the basic taxonomic information about Lecythidaceae needed to promote further systematic and ecological research. The results of other aspects of our research have been (Bassini & Becker, 1990; Mori, 1992; Mori & Becker, 1991) or will be published elsewhere. A paper on the diversity, density, frequency, and dominance of Lecythidaceae in the 100-ha plot is in preparation.

## Taxonomic Treatment

Modern taxonomic treatments of neotropical Lecythidaceae (Mori & Prance, 1990a; Prance & Mori, 1979) are available. Therefore, detailed synonymy,