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Among the myriad ways to reconstruct past climates, pollen cores is one of the most powerful. As long as analogies to modern climate hold, pollen rain composition can reveal temperature and moisture changes as far back as the Cretaceous. Unfortunately, the skewed geographic provenience of the available analyses limits the utility of pollen cores for global climate reconstruction. A recent map showing the provenience of pollen cores worldwide (Myriad ways to reconstruct past climate, 2001, p.658) has only Europe, the United States, and a few places along the coasts of South America as thoroughly sampled. Eurasia, Australia, Asia, Africa, and the Amazon basin are almost devoid of pollen sites.

What little we know about past pollen composition in the Amazon is summarized in the first two chapters of the Amazon Pollen Manual and Atlas by Colinvaux, Oliveira, and Patiño. Amazon lake sediments consistently hold large concentrations of pollen, in spite of the surrounding flora being largely insect-pollinated and producing relatively little pollen. Pollen concentrations in a lake in lowland rainforest in Brazil are about 247,600 grains/cubic microliter and those in a lake in eastern Ecuador are about 100,000 grains/cubic microliter. These values compare favorably with pollen concentrations in lake sediments in the United States or Europe. Similar sedimentation rates may be due to tropical lakes having larger catchment areas than temperate lakes or to tropical rain torrents bringing more wash-off pollen. In any case, abundant pollen sediments exist. However, someone needs to identify the pollen in them.

The Amazon contains an estimated 80,000 species of vascular plants, and the Amazon Pollen Manual and Atlas illustrates fossil spores of just 421 species. Yet, analyses of the presence and abundance of these few pollen types contain significant signal of past forest communities and thus, climate. The authors, who have worked in neotropical palynology for most of their careers, chose the pollen types to be illustrated from their reference
collections of about 2,000 extant Amazonian pollen species. The illustrated 
pollen grains are the most abundant or decisive elements seen in Amazonian 
samples. By illustrating these 400+ key spores, this book opens up 
Amazonian palynology to others. Because most of the Amazon basin lies in 
Brazil, the book is bilingual, with all chapters (except the one with pollen 
descriptions) appearing in English and Portuguese. Following a historical 
introduction, the first half of the Amazon Pollen Manual and Atlas has 
chapters on piston coring in lake sediments; laboratory protocols for 
describing, handling, and storing pollen cores; and an illustrated introduction 
to pollen descriptive terminology.

The second half of the book presents a key to the 421 fossil pollen taxa and 
descriptions of each pollen genus or family. All photomicrographs of pollen or 
spores are reproduced on a scale of 1 millimeter to 1 micron, so that 
dimensions of the grains in microns can be read from the plates with an 
ordinary metric system ruler. A glossary, an extensive bibliography, two 
indices, and a list of international suppliers with their addresses and web 
sites complete the Atlas.

How pollen studies have contributed, and defined, our understanding of 
Amazonian vegetation history, is illustrated by the long-standing controversy 
about the extent of Pleistocene drying in the Amazon basin and the 
concomitant replacement of forests by savannas. Almost the only direct 
evidence for reduced precipitation in the Amazon basin at around 18,000 
years ago comes from well-dated marsh sediments taken from a plateau in 
the east-central Brazilian Amazon basin. However, there are so few analyses 
and their distribution is so biased, that the controversy remains undecided. 
An extremely readable summary of the controversy by Colinvaux in this 
Atlas suggests that relatively few strategically placed pollen cores would 
settle the matter.

This book is the first published atlas of Amazon pollen types and as such is 
very important. Because it covers everything, from the history of Amazonian 
pollen coring to rubber boats to statistical analyses, this book is unusual. 
However, precisely because of its unusual breadth it will stand for a long 
time as an introduction to the literature of Amazonian palynological research 
as well as a research tool.

Reference

Myriads ways to reconstruct past climate. (2001). Science, 292(no. 5517), 
658-659.

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