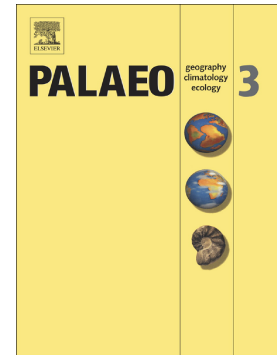


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Holocene precipitation changes in the Maya forest, Yucatán Peninsula, Mexico

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Abstract

Holocene fossil pollen samples (n=38) from Lake Silvituc in Mexico were analyzed with the analog technique using modern pollen samples (n=98) of the Yucatán Peninsula, Mexico. Calculated dissimilarity indices allow us to reconstruct the vegetation and to develop a precipitation record for the last 7900 years. The Middle Holocene shows a gradual increase of precipitation and a marked drop in reconstructed precipitation around 4200 BC. During the Late Holocene two phases were identified: Phase I (2500 BC – 1 AD) shows the greatest increase in precipitation with four peaks around 1200 BC, 650 BC, 200 BC and 1AD. Also a period of increased precipitation resulted for the period between 200 and 500 BC. Periods of reduced precipitation were detected at 900–1100 BC, 500–600 BC and 100–190 BC. Phase II (1-2000 AD) encompasses several strong dry events during the following periods: 150–300 AD, 750–900 AD, 1050–1180 AD, and 1530–1580 AD. A strong reduction of 32% in precipitation in the late Preclassic Period (100-300 AD) was detected. Non-analogs of Phase II are associated with periods of reduced precipitation and fall into time periods of extended droughts related to the Maya Late Classic and the Little Ice Age. A limiting factor on the use of analogs for tropical forests is that a combination of different analogs for the same fossil pollen signal exists. Interpretation under these circumstances requires good knowledge of the ecology of the taxa and *a priori* characterization of the modern samples.

Key words: modern analogs, pollen, drought, human-environment interaction, climate dynamics

1. Introduction

The quantitative approach to palaeoecology has increased considerably during the last decades by considering large numbers of high-resolution records. This has improved spatial and temporal precision (Birks, 1996; Rull,

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