

## Preliminary palynological results on the Pleistocene–Holocene transition, Seram Trench, offshore Irian Jaya, Indonesia (extended abstract)

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### Introduction

These first palynological results are part of a multidisciplinary high-resolution research effort on the Pleistocene–Holocene transition, as recorded in a Snellius-II marine piston core from the Seram Trench, some 60 km offshore Irian Jaya, Indonesia (core G5-2-053P: 03°35'91" S, 132°09'81" E, 1991m waterdepth, see Van Hinte 1986). The timeframe is provided by stable oxygen isotope stratigraphy. Measurements were performed on the planktonic foraminifer *Globigerinoides ruber*. The proximity of the core site to Irian Jaya is expected to ensure that the pollen record largely reflects vegetational developments of that island. Samples of 2 cm<sup>3</sup> were processed using standard methods; percentages were based on the dry-land tree pollen total (e.g. excluding mangrove taxa).

### Results

Before ca 13 500 BP, montane forest zones were low as suggested by the relatively high percentages of taxa from the mid-upper montane forests, indicating a cooler climate than at present (*Nothofagus*, *Dacrycarpus*, *Engelhardia*, *Phyllocladus* and *Podocarpus* in Fig. 1; present distribution: 1800–3200m above sea level). Somewhat higher Gramineae values and low percentages of taxa indicating a perhumid climate (*Asplenium*, *Lycopodium cernuum*, *L. phlegmaria* and *Selaginella*) may suggest slightly drier climatic conditions. The relative dominance of *Nothofagus* in the montane forest vegetation seems also related to a somewhat drier climate, as *Nothofagus* is relatively more resistant to water deficits (Ash 1982).

After ca 13 500 BP, mid-upper montane forests began to retreat to higher altitudes, as can be inferred from decreased percentages. Mangrove vegetation expanded strongly at ca 11 750 BP. As already indicated by earlier research in the region (Van der Kaars 1991), this expansion is probably linked with the contemporaneous increase in the rate of sea level rise (melt-water pulse IA, Fairbanks 1989), resulting in increased accumulation of land-derived fine sediment on the shelf. The high fungi percentages from ca 11 750 to ca 9500 BP could be: 1) another consequence of this increased accumulation of land-derived sediments, 2) related to increased erosion onshore caused by the environmental upheaval during the Pleistocene–Holocene transition, or 3) related to the expansion of mangrove cover.

The onset of slightly warmer and wetter climatic conditions, as indicated by a decrease in *Nothofagus* and an increase in *Asplenium*, *Lycopodium cernuum* and in the sub to low-montane taxa *Celtis* and *Cyatheaceae* (present distribution: ±1000–1800 m above sea level) shortly after ca 11 750 BP, was another consequence of higher sea levels. The expansion of shallow warm waters around Irian Jaya will have had a warming and humidifying effect on the climate of the island.

The reduced values of mangrove taxa and *Cyatheaceae*, suggesting a reduced rate of sea level rise and a return to slightly drier conditions, in the period from ca 10 500 to ca 9500 BP can be seen as a reflection of the Younger Dryas event in the Seram Trench record.

At ca 9500 BP, climatic conditions were already close to present-day values; taxa indicating perhumid conditions reached high values and *Engelhardia*, *Phyl-*

Seram Trench core G5-2-053P  
03°35'91" S, 132°09'81" E, 1991 m waterdepth  
selected palynomorph taxa

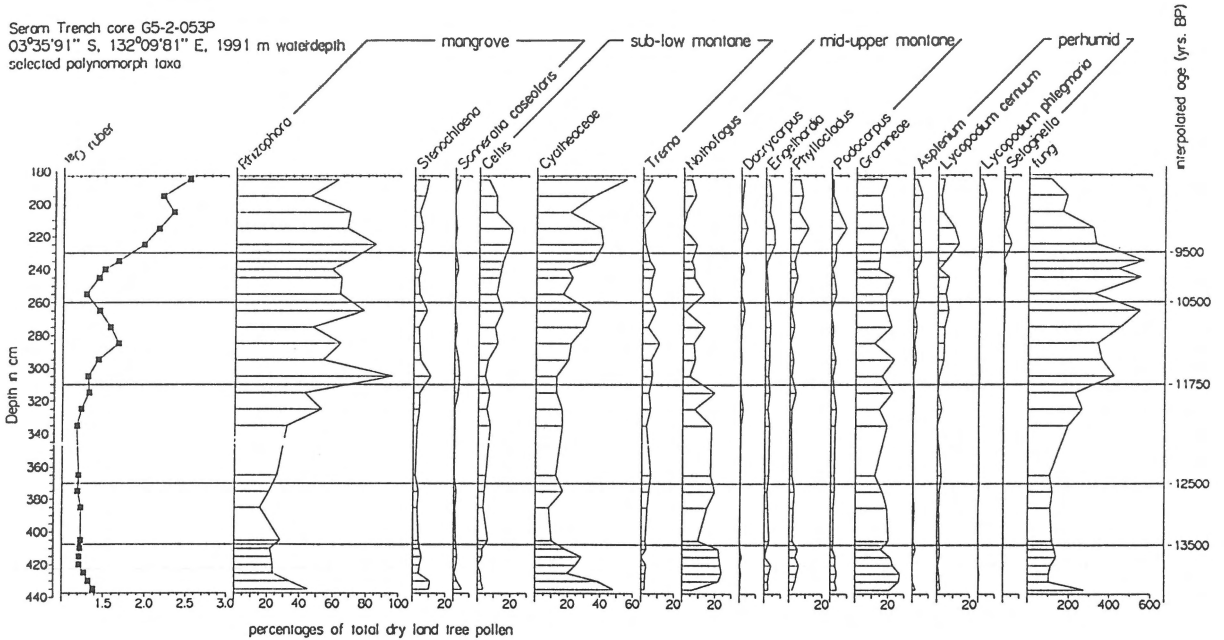


Fig. 1. Stable oxygen isotope curve based on *Globigerinoides ruber* and relative frequency curves (in percentages of total number dry-land tree pollen) of selected palynomorph taxa from Seram Trench core G5-2-053P. Grouping is according to elevation above sealevel (mangrove–montane taxa) and humidity indicators.

*locladus* and *Podocarpus* percentages also increased, suggesting expansion to higher altitudes of humid montane forests, while Gramineae reach low values. Earlier research (Van der Kaars 1991) had already suggested a relation between increased *Phyllocladus* scores and the onset of a warmer and wetter climate on Irian Jaya, i.e. the start of the Holocene.

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