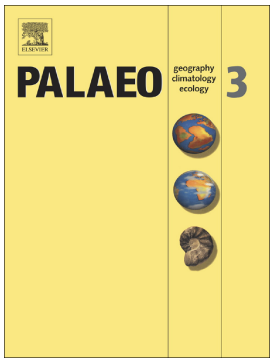

Late quaternary environmental dynamics inferred from marine sediment core GeoB6211-2 off southern Brazil

Fang Gu, Cristiano M. Chiessi, Karin A.F. Zonneveld, Hermann Behling

PII: S0031-0182(17)31066-0
DOI: https://doi.org/10.1016/j.palaeo.2018.01.015
Reference: PALAEO 8624

To appear in: *Palaeogeography, Palaeoclimatology, Palaeoecology*

Received date: 20 October 2017
Revised date: 11 January 2018
Accepted date: 11 January 2018

Please cite this article as: Fang Gu, Cristiano M. Chiessi, Karin A.F. Zonneveld, Hermann Behling , Late quaternary environmental dynamics inferred from marine sediment core GeoB6211-2 off southern Brazil. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Palaeo(2017), https://doi.org/10.1016/j.palaeo.2018.01.015

Late Quaternary environmental dynamics inferred from marine sediment core GeoB6211-2 off southern Brazil

Fang Gu[a], Cristiano M. Chiessi[b], Karin A.F. Zonneveld[c], Hermann Behling[a]

[a] University of Goettingen, Department of Palynology and Climate Dynamics, Untere Karspüle 2, 37073 Göttingen, Germany
[b] University of São Paulo, School of Arts, Sciences and Humanities, Rua Arlindo Bettio, 1000, CEP03828-000 São Paulo SP, Brazil
[c] University of Bremen, MARUM - Center for Marine Environmental Sciences, Leobener Str. 8, 28359 Bremen, Germany

Corresponding email: Fang.Gu@biologie.uni-goettingen.de

Abstract

Vegetation and climate changes in southern Brazil, as well as the dynamics of the adjacent South Atlantic were investigated through the analyses of pollen, spores and dinocysts from marine sediment core GeoB6211-2 that covers the last 19.3 cal kyr. The pollen record indicates the dominance of grassland (campos) in southeastern South America (SESA), reflecting cold and/or dry conditions during the Last Glacial Maximum. Forests, mainly gallery forests, expanded slightly during Heinrich Stadial 1, suggesting slightly wetter conditions. A stronger expansion of the Atlantic lowland rainforest is noticed in the record after ca. 5.5 cal kyr BP, likely due to wetter conditions. The relatively high amount of exotic *Nothofagus* pollen, transported by wind, rivers and then by oceanic currents northwards to the study site, as well as the dinocyst *Brigantedinium spp.,* indicate a noticeable influence of the Brazilian Coastal Current from the south between 19.3 and 14.8 cal kyr BP. After that, the decrease in *Nothofagus* and *Brigantedinium spp.* together with the increase in dinocyst *Operculodinium centrocarpum* indicate that the Brazil Current from the north dominated the coring site. The abundance of freshwater algae between ca. 19.3 and 17.0 cal kyr BP suggests that the Rio de la Plata mouth was located close to the coring site during this period, and its discharge of nutrient-rich freshwaters strongly affected the upper water column. Sea level rise decreased this impact during the late glacial phase by moving the coastline further away from the core site. The presence of the Brazil Current at the core site became stronger after ca. 15 cal kyr BP and strongest after 9 cal kyr BP. In summary, the pollen, spores and dinocyst records from core GeoB6211-2 provide important climatic records to reconstruct the environmental changes in SESA.

Keywords

South Atlantic, pollen, dinoflagellate cysts, environmental change, vegetation history, ocean currents

1. Introduction

Records of past terrestrial and marine environmental changes as well as underlying interactions and driving mechanisms are important to understand and to project future environmental changes