

Evidence of early settlement of the Azores archipelago using a high-resolution paleolimnological approach

Raposeiro PM¹, Gonçalves V¹, de Boer EJ², Rull V², Hernández A², Souto M¹, Costa AC¹, Pla-Rabés S⁶, Ritter C¹, Benavente-Marín M², Richter N³, Amaral-Zettler L^{4,5}, Huang Y³, Gordon V³, Matias M^{8,9}, Pereira CL^{9,10}, Arantza L², Trigo RM¹¹, Saez A⁷, Bao R¹² & Giralte S²
pedro.mv.raposeiro@uac.pt

- ¹ Centro de Investigação em Biodiversidade e Recursos Genéticos, CIBIO, InBIO Laboratório Associado, Pólo dos Açores & Faculdade de Ciências e Tecnologia da Universidade dos Açores, Ponta Delgada, Açores, Portugal
- ² Institute of Earth Sciences Jaume Almera (ICTJA), Spanish National Research Council (CSIC), Barcelona, Spain
- ³ Department of Earth, Environmental, and Planetary Sciences, Brown University, Providence, USA
- ⁴ Department of Marine Microbiology and Biogeochemistry, NIOZ Royal Netherlands Institute for Sea Research, AB Den Burg, The Netherlands
- ⁵ Freshwater and Marine Ecology, Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, Amsterdam, The Netherlands
- ⁶ CREA, University Autònoma of Barcelona (UAB), Bellaterra, Spain
- ⁷ Department of Earth and Ocean Dynamics, Universitat de Barcelona, Barcelona, Spain
- ⁸ Museo Nacional de Ciencias Naturales, CSIC, Madrid, Spain
- ⁹ Rui Nabeiro Biodiversity Chair, MED – Mediterranean Institute for Agriculture, Environment and Development, University of Évora, Portugal
- ¹⁰ Centre for Macroecology, Evolution and Climate, Globe Institute, University of Copenhagen, Denmark
- ¹¹ Instituto Dom Luiz (IDL), Faculty of Sciences, University of Lisboa, Lisbon, Portugal
- ¹² Centro de Investigacións Científicas Avanzadas, Universidade da Coruña, Spain

two islands of the archipelago. After this first human impact period an extensive deforestation and the large-scale introduction of exotic species have reshaped the lake and island ecosystems and sedimentary dynamics to present-day status. Hence, our results suggest that the human impact in the Azores archipelago started approximately three centuries prior to the official occupation of the archipelago.

The discovery and settlement of the Azores archipelago is generally attributed to the Portuguese during the XVth century, but recent insights have raised questions about whether the islands were discovered earlier. Paleolimnological data from São Miguel suggest that the island was settled 150 years before the official Portuguese arrival date. To pinpoint the date of first human arrival in the archipelago, we performed multiproxy characterizations (e.g. pollen, diatoms, chironomids, XRF geochemistry, faecal related organic compound) using long continuous sequences of natural lacustrine sedimentary archives to reconstruct past environmental changes for the last millennium across four of the nine islands of the Azores archipelago. We have found evidence of livestock introduction (incl. spores of coprophilous fungi, sterols), extractive forestry, and cereal cultivation around 1150 CE in