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# When were the Azorean Islands really colonized? A high-resolution paleolimnological approach

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## Abstract

The discovery and colonization of islands are crucial to understand the colonization patterns of new territories, the spread of languages, past economic trade, diffusion of past societal and knowledge during the past millennium. However, historical and archaeological records are scarce and incomplete on many islands, including the Azores, hampering the determination of the exact age of first human settlements. The most commonly accepted date for the first settlement on the Azores islands based on historic documents is 1432 A.D. However, a recent environmental reconstruction of São Miguel island that covers the last 730 years clearly shows that the first-settlements of this island took place by ca. 1287 A.D., approximately 150 years prior to the currently recognized colonization. Here we present a new perspective, using both classical (e.g. pollen and spores from higher plants, fungal

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spores, algae remains, charcoal particles, plant and animal fragments) as well as cutting-edge approaches (e.g. ancient DNA and faecal related organic compounds) to unequivocally trace the first signs of human activity preserved in long continuous sequences of natural sedimentary archives. Our objective was to perform robust high-resolution climate and environmental reconstructions for the last millennium in order to pinpoint the date that the first settlers arrived, the timing of island occupation and the spread of new settlements. These reconstructions were performed using a multiproxy characterization of sedimentary lacustrine records located on five islands distributed in an NW-SE transect. Preliminary data constrains stratigraphic points that characterize two phases of occupation of Azorean Islands. First human activities started on several islands with the introduction of cattle, extractive forestry and cereal cultivation, followed by extensive deforestation and the large-scale introduction of exotic species on land and into lakes (e.g. exotic plant species and fish introductions), which shaped the present-day lake ecosystems.

**Keywords:** Paleolimnology, Azores, classical and cutting, edge approaches, colonization patterns, climate and environmental reconstructions