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COMPUTED RADIOGRAPHY, PIXE AND XRF ANALYSIS OF PRE-COLONIAL POTTERY FROM MARANHÃO, BRAZIL

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ABSTRACT

This work concerns the archaeometric analysis of ceramic fragments from archaeological excavations carried out in “Sambaqui do Bacanga”, “Sambaqui do Panaquatira” and “Rabo de Porco”, located in the São Luiz city area, at Brazilian northeast. Ancient civilizations that inhabited that territory were characterized as fishing, catchers, hunters and ceramist populations. Dates obtained by thermoluminescence ranged from 6600 to 127 BP. The studied samples were sixty three representative pottery fragments selected of stratigraphic levels from the surface up to 170 cm deep for Sambaquis do Bacanga and Panaquatira and from surface up to 105 cm depth for Rabo de Porco. The three analytical methods employed were Computed Radiography, PIXE and XRF. Sixteen elements were measured with good statistics in the different ceramic samples through EDXRF and PIXE analysis: Al, Si, P, S, Cl, K, Ca, Ti, Mn, Fe, Cu, Zn, Rb, Sr, Y and Zr. Multivariate statistical analysis, Hierarchical Cluster Analysis (HCA) and Principal Component Analysis (PCA), of the fragments elemental composition were performed to separate and correlate the groups of the samples. Fragments of the three archaeological sites grouped into two clusters, the first is composed of samples from “Sambaquis do Bacanga and Panaquatira”, and the second consists of the “Rabo de Porco” samples. This result indicates that each cluster of fragments was manufactured with different clays, and “Sambaquis do Bacanga and Panaquatira” fragments are derived from the same source or same kind of clay. The internal structure of the ceramic fragments observed by Computed Radiography revealed the presence of various sizes and types of anti-plastics in the sherds.

1. INTRODUCTION

In the State of Maranhão, where there is a lack of sufficient archaeological information to compose a minimum framework on the pre-colonial occupations in its territory, three archaeological sites are being excavated, namely: Sambaqui do Bacanga, Sambaqui da Panaquatira and Rabo de Porco. Several types of material traces were evidenced in these archaeological excavations, such as remains of fire, human skeletons, remains of animal bones, remains of fish, shells and ceramic objects [1].

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