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Trans-Regional Technologies and the Lapita Problem: characterisation of volcanic glass inclusions by electron microprobe

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Introduction

Analysis of pre-modern pottery of the Pacific has long attempted to formulate measures independent of style for constructing archaeologically meaningful groups. However, the variable character of fabrics and the longevity of production (Lapita and post-Lapita wares from 3000 years ago to the present) have tended to obscure differences due to changes in production practices and resources through time and differences relating to the exchange of ceramics between islands or regions. In this poster we outline a preliminary study that employs an economical and robust technique to distinguish both within- and between-region groups. This is achieved with electron microprobe analysis of small volcanic glass fragments present in wares tempered with volcanic sands, and interpretation based on Principal Components Analysis. The method builds on the chemical groupings for glass from different volcanic complexes in the Pacific established through high energy ion beam (PIXE-PIGME) analysis.

The purpose of this study is to characterise a selection of samples of pottery from the Duke of York's peninsula using electron microprobe analysis of very small glass fragments in the sections that ranged in size from around 0.05 mm to 1 mm.. The study involved the identification and elemental characterisation of individual fragments of glass in a section. Principal Component Analysis was used to identify structure latent in the dataset. The results of the study show that clear characterisation is possible to enable the wider application of the technique to Lapita and post Lapita ceramics produced originating in volcanic areas of the Pacific.