Journal of Archaeological Science: Reports 6 (2016) 518–535

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Identifying prehistoric trade networks in the Massim region, Papua New Guinea: Evidence from petrographic and chemical compositional pottery analyses from Rossel and Nimowa Islands in the Louisiade Archipelago

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ARTICLE INFO

Article history:
Received 17 January 2016
Received in revised form 21 March 2016
Accepted 22 March 2016
Available online xxxx

Keywords:
Massim
Papua New Guinea
Rossel Island
Pottery
Trade networks
Pottery sourcing

ABSTRACT

This paper provides preliminary insight into the nature and complexity of prehistoric pottery trade in the southern Massim islands of eastern Papua New Guinea. Petrographic and chemical compositional analyses are undertaken on pottery assemblages from two islands, Rossel and Nimowa, in the Louisiade Archipelago. Pottery was first introduced to Rossel Island from 550 cal. BP, whereas it was present on Nimowa from at least 1340–1290 cal. BP. Clay and sand samples from several Massim islands were also included in the analyses to assess the variability in the raw materials used to make pottery on different islands, and to determine if the place of manufacture for the analysed pottery can be identified. Petrographic analysis of 32 sherds broadly characterised eight temper groups, with the distribution of tempers not clearly related to any specific site or island. Chemical analysis of 55 sherds and 20 clay samples indicated that the islands of the Louisiade Archipelago are closely related in terms of their chemical characteristics, but can be differentiated from other groups of islands in the Massim region. Four major groups of pottery were identified with further groups beginning to emerge. There was some correlation between the chemical groups and the petrographically identified tempers. The data suggest that most of the pottery came from within the Louisiade Archipelago and the southern Massim, with the northern Massim islands having never been a major source of pottery on Rossel and Nimowa. It is argued that a southern Massim exchange network was in operation at least since the establishment of the Malakai site, and continued to operate after the later introduction of pottery to Rossel. The inclusion of Rossel in regional pottery trade correlates with the purported establishment of the *Kula* exchange network, with causal links discussed.

1. Introduction

Identifying patterns of pottery manufacture and trade within and between islands has contributed significantly to understanding the interaction networks of late Holocene Pacific Island communities (Green and Kirch, 1997; Irwin and Holdaway, 1996; Kirch, 1988; Summerhayes, 2000). Petrographic analysis of a sherd's mineralogical inclusions has been the most widely used technique for assessing the variability in a pottery assemblage as it relates to the selection of clay and temper for manufacture (Dickinson, 2006; Dickinson and Shutler, 1968; Key, 1968). Chemical analysis of pottery has gained traction in more recent years as a complementary, yet independent means of identifying local pottery manufacture and determining patterns of pottery trade (Gratuze et al., 2001; Neff, 1992). It has proven to be a powerful method for distinguishing pottery manufactured using clays and tempers from geologically distinct islands (Bickler, 1997; Cochrane and Neff, 2006; Eckert and James, 2011; Kennett et al., 2004; Leclerc, 2016). Combining the two methods allows for a more robust interpretation of the distribution of pottery in regional exchange networks.

This paper provides the first insight into the nature and complexity of prehistoric pottery trade in the southern Massim islands, off the eastern tip of the Papua New Guinea mainland (Fig. 1). Petrographic and chemical (laser ablation inductively coupled mass spectrometry; henceforth LA-ICP-MS) analyses were applied to pottery assemblages from two islands, Rossel and Nimowa, in the Louisiade Archipelago (Fig. 2). The aims of the study are two-fold. The first is to assess whether enough variability exists between the geologies of the southern Massim

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http://dx.doi.org/10.1016/j.jasrep.2016.03.034
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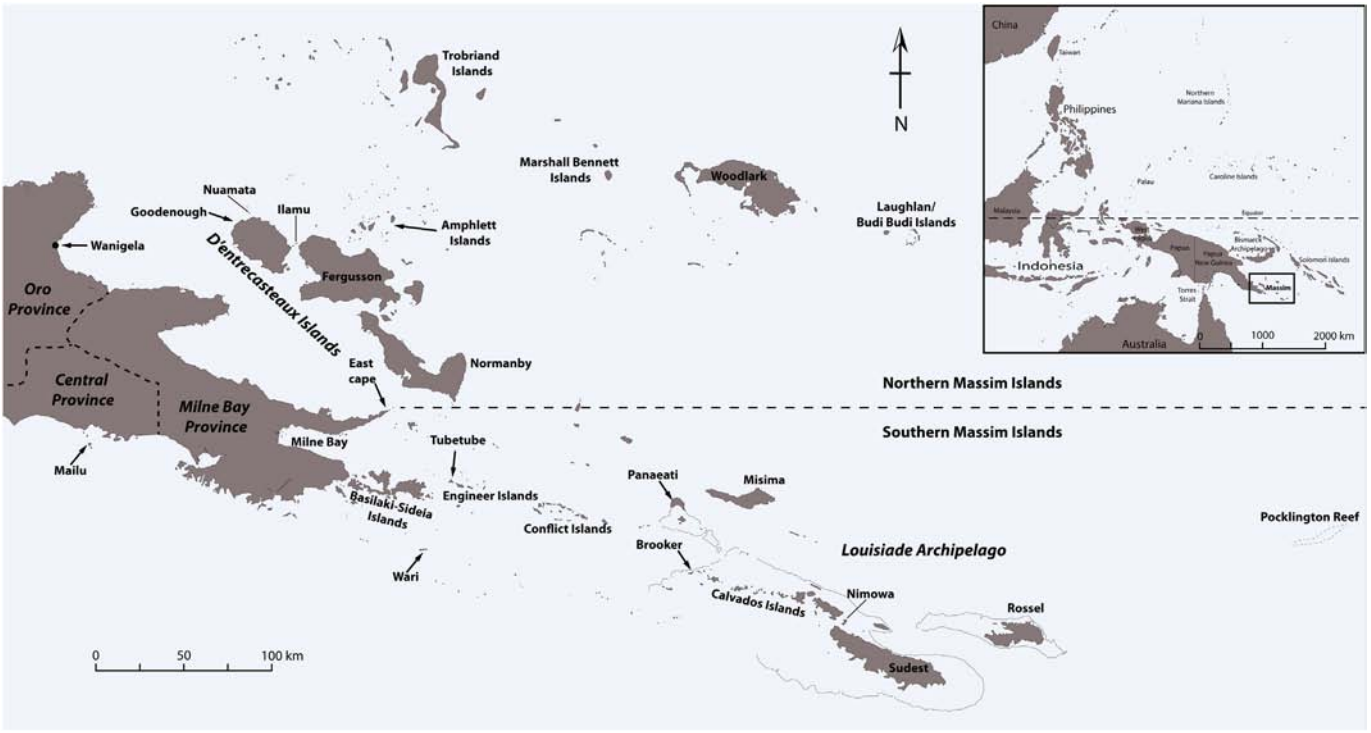

Fig. 1. Massim region of Papua New Guinea, with inset showing the location of the Massim in the Western Pacific Islands. Thick arrows indicate locations of modern pottery manufacture. Other locations mentioned in the text are labelled.

islands to allow pottery manufactured on different islands to be identified. The second is to determine if the pottery recovered from excavated contexts on Rossel and Nimowa was produced on the island where it was found, or imported from elsewhere. To achieve these aims, pottery sherds from five sites were included in the analysis, one from Nimowa Island (Malakai) and four from Rossel Island (Wule, Ghakpo, Pambwa and Morpa). In addition, beach sands from Tubetube and Brooker islands, both known ethnographically as pottery producing centres, were compared petrographically with beach sand from Rossel Island to assess whether the minerals present in the sands differed enough to allow local pottery industries on these islands to be identified. Raw clay samples from several southern Massim islands (Rossel, Nimowa, Misima, Brooker and Tubetube) were also included in the chemical analysis to ascertain the expected variation in clays across a range of geological zones (Figs. 1 and 3). By drawing on results from similar analyses undertaken on pottery assemblages elsewhere in the Massim, temporal and spatial aspects of prehistoric regional exchange networks are subsequently explored and implications for Massim prehistory assessed.

2. The Massim as a cultural region

The Massim region is an anthropologically defined cultural area that encompasses the eastern tip of the New Guinea mainland and the adjacent offshore islands. It includes the entire political province of Milne Bay, as well as parts of the Central and Oro provinces of Papua

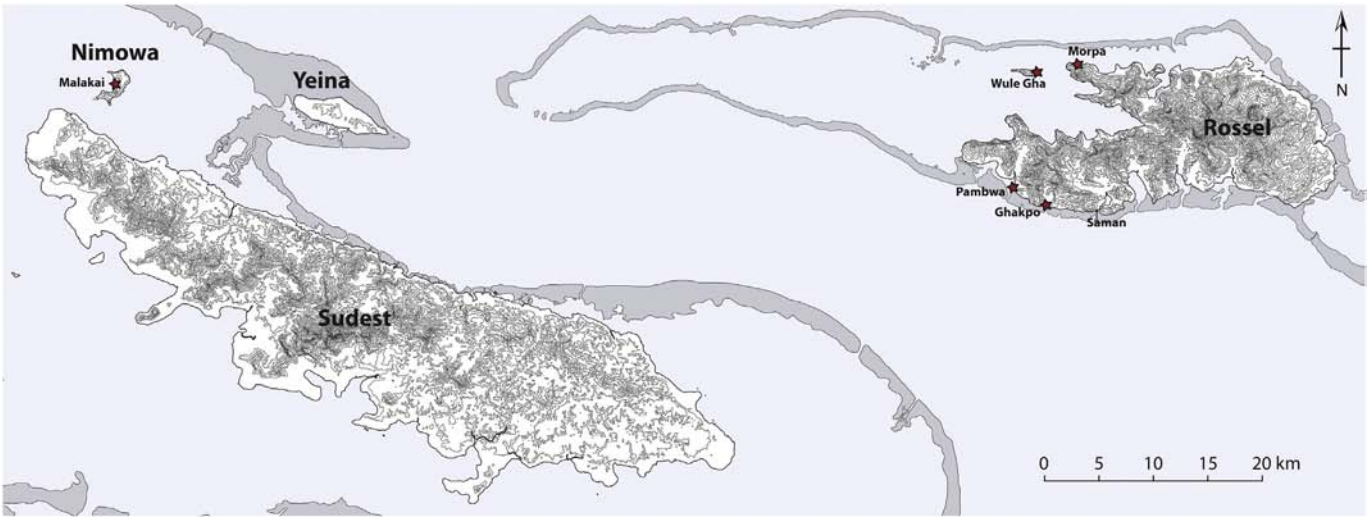

Fig. 2. Map of eastern islands in the Louisiade Archipelago showing the location of sites where pottery was sampled. Darker grey shading indicates reef.