



New archaeological insights from petrographic analysis of ceramics from the Bocas del Toro Archipelago, Panama

Kathleen M. Marsaglia^{a,*}, John A. Lawrence^a, Scott M. Fitzpatrick^{b,c}, Thomas A. Wake^{d,e}

^a Department of Geological Sciences, California State University Northridge, USA

^b Department of Anthropology, University of Oregon, USA

^c Museum of Natural and Cultural History, University of Oregon, USA

^d Cotsen Institute of Archaeology, University of California, Los Angeles, USA

^e Department of Anthropology, University of California, Los Angeles, USA

ABSTRACT

In this study, we conducted the first petrographic analysis of pottery from several Pre-Columbian archaeological sites located in Bocas del Toro province along the Caribbean coast of Panama. The fifty-four sherds examined in this study included surface finds collected from the sites of Red Frog (RF) and Punta Vieja Arriba (PVA) on Bastimentos Island, the Cerro Brujo (CB) site on the mainland, and excavated samples from Sitio Drago (SD), Isla Colon. Petrographic examination of sherd thin sections shows that different sandy materials (seven constituent natural and/or manually-added temper groups) were used in their production. Representative sherd compositions from each group were determined by petrographic point-counts ($n = 200$) using two matrix (silt and clay) and 14 mineral and rock fragment categories for sand grains. The sand in RF sherds is mainly fragments of mudstone, whereas sherds from the PVA and CB sites contain different proportions of sand-sized quartz, feldspar, dense minerals, and several varieties of volcanic lithic fragments. The latter components are constituents derived from local Panamanian geologic units, including one with pyroclastic temper that likely comes from a volcanically active region, such as the El Baru Volcano. Some of the archaeological sites (SD and PVA) have a greater variety of sherd compositional/temper groups than others, implying that people inhabiting these sites were actively engaged in acquiring materials and/or ceramics from multiple sources regionally.

1. Introduction

Thin-section petrography of prehistoric pottery is a critical analytical tool for answering a host of questions surrounding ceramic manufacturing techniques, trade and exchange systems, and settlement patterns, among many others. Petrography also effectively complements, and in some cases can better answer questions that bulk compositional techniques such as INAA and XRF are unable to easily resolve (e.g., Lawrence et al., 2016; Pavia et al., 2013; Dickinson, 2006; Fitzpatrick et al., 2003). Not only can petrographic analysis identify the diversity of mineral and paste compositions, but also tempering agents, which can be culturally specific and change through time. As a result, this type of analysis has been employed successfully in many parts of the world, including the Pacific (Dickinson, 2006; Fitzpatrick et al., 2003) and Caribbean (Lawrence et al., 2016; Pavia et al., 2013), which have helped to reconstruct how ancient potters produced different wares, inter-island exchange systems, and other modes of cultural behavior.

In this study, we conducted a petrologic/petrographic study of sherds from sites in the Bocas del Toro region of Panama (Figs. 1 and 2) (the first such study in this region) with the goal of examining intra-site and local diversity of sherd compositions focusing on the sand-sized constituents and/or temper and identifying potential source regions for these compositional (temper) groups based on their sand mineralogy and lithic types. While this analysis is still in its infancy, results provide a more nuanced understanding of how ancient potters in the area selected and used various constituents for manufacturing pottery, and initial insight into how these resources were acquired and/or exchanged.

At least 36 archaeological sites have been visited, mentioned, or located on maps in Bocas del Toro Province (Stirling and Stirling, 1964, $n = 4$; Gordon, 1962, 1982, $n = 28$; Linares and Ranere, 1980, $n = 4$ [14 loci]). Various attempts to relocate and properly document these sites, however, especially those mentioned by Gordon (1962), through identifying their respective GPS locations, detecting surface artifacts, and conducting surface collections have met with limited

* Corresponding author.

E-mail address: kathie.marsaglia@csun.edu (K.M. Marsaglia).

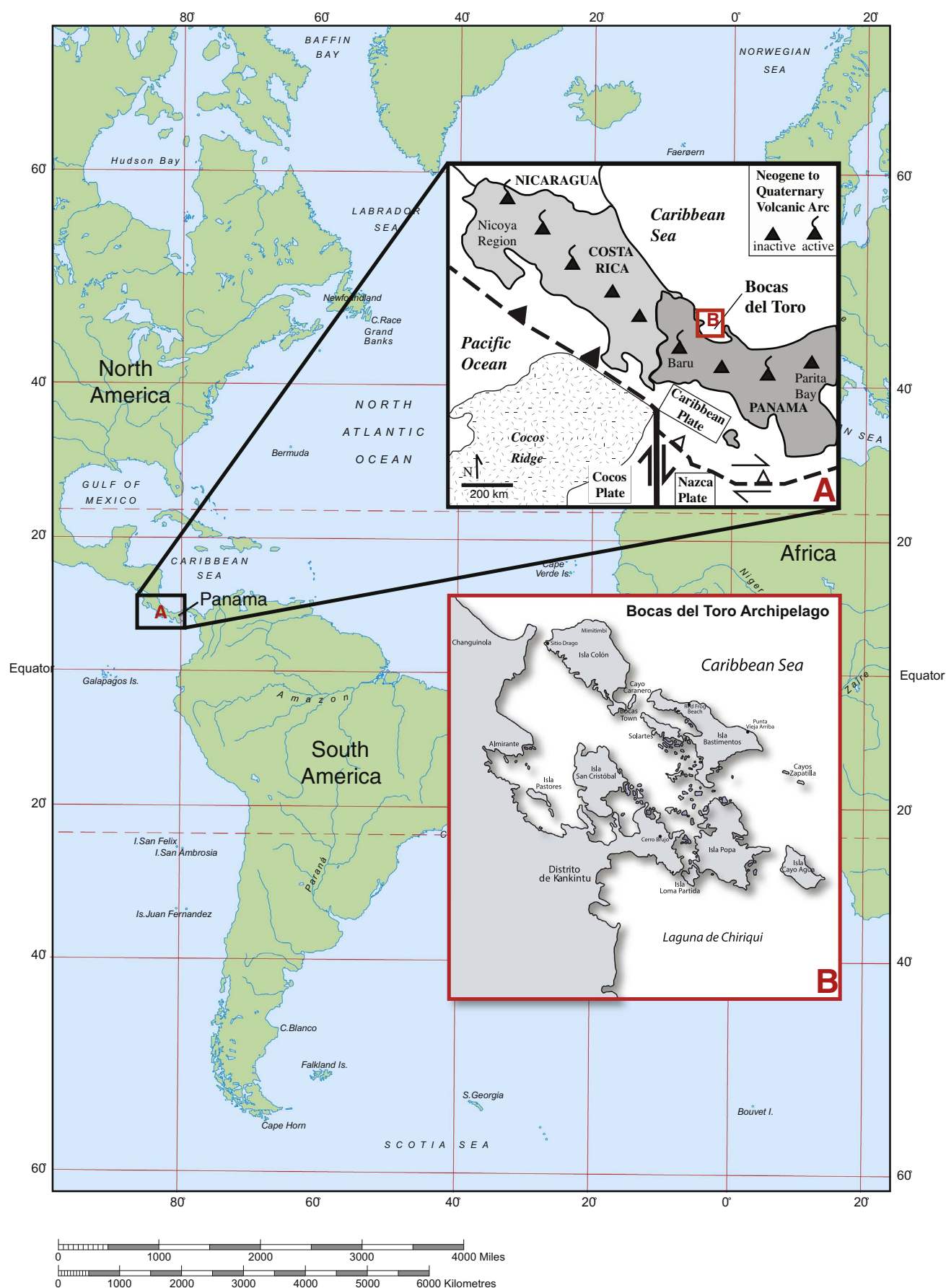


Fig. 1. Location map showing the Bocas del Toro study area, tectonic plate boundaries (barbed dashed lines where convergent, arrowed where transform; plate names are boxed), and the Central American Volcanic Arc, the likely source of volcanic temper discussed in this study. The Cocos Ridge is a submarine oceanic high. Map modified from Klaus et al. (2011) and Coates et al. (2005).

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