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Paleoenvironmental evidence for first human colonization of the eastern Caribbean

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ABSTRACT

Identifying and dating first human colonization of new places is challenging, especially when group sizes were small and material traces of their occupations were ephemeral. Generating reliable reconstructions of human colonization patterns from intact archaeological sites may be difficult to impossible given post-depositional taphonomic processes and in cases of island and coastal locations the inundation of landscapes resulting from post-Pleistocene sea-level rise. Paleoenvironmental reconstruction is proving to be a more reliable method of identifying small-scale human colonization events than archaeological data alone. We demonstrate the method through a sediment-coring project across the Lesser Antilles and southern Caribbean. Paleoenvironmental data were collected informing on the timing of multiple island-colonization events and land-use histories spanning the full range of human occupations in the Caribbean, from the initial forays into the islands through the arrival and eventual domination of the landscapes and indigenous people by Europeans. In some areas, our data complement archaeological, paleoecological, and historical findings from the Lesser Antilles and in others amplify understanding of colonization history. Here, we highlight data relating to the timing and process of *initial* colonization in the eastern Caribbean. In particular, paleoenvironmental data from Trinidad, Grenada, Martinique, and Marie-Galante (Guadeloupe) provide a basis for revisiting initial colonization models of the Caribbean. We conclude that archaeological programs addressing human occupations dating to the early to mid-Holocene, especially in dynamic coastal settings, should systematically incorporate paleoenvironmental investigations.

1. Introduction

1.1. Issues in colonization of the Caribbean

Irving Rouse (1986, 1992) proposed long ago that early ceramic-age (or Neolithic) colonists to the Caribbean (Saladoid archaeological cultures) introduced to the Antillean archipelago agriculture, the use of pottery, and established lifeways and belief systems from their greater Amazonian homeland. He developed a stepping-stone colonization model, whereby settlers first targeted specific islands closer to mainland South America before moving onto other islands further up the archipelago. Recent investigations are increasingly showing that earlier groups of people (Archaic populations) occupying the islands may have introduced cultigens and produced pottery and some researchers argue that first and later settlers made direct voyages from northern South America to the northern Lesser Antilles or the Greater Antilles, thus bypassing nearly 70% of the island arc (Callaghan, 2010; Fitzpatrick, 2013; Fitzpatrick et al., 2010; Keegan, 2010; Pagán-Jiménez, 2013; Pagán-Jiménez et al., 2015; Rodríguez Ramos et al., 2008).

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Archaeological traces of the earlier Archaic residents are considerably different than the later and, apparently, more densely settled Saladoid and post-Saladoid groups. Owing to a variety of taphonomic and sampling issues the earliest colonists to the Caribbean dating to the early/mid-Holocene in particular are difficult to identify using traditional methods of archaeological surveying, testing, and excavation. Additional lines of evidence from paleoecology are required to provide data on small-scale scouting or colonization events and habitat modifications by early as well as later occupants (Athens et al., 2014; Burney, 1997a, 1997b; Foley et al., 2014).

We conducted an extensive paleoenvironmental investigation across nine islands of the Lesser Antilles and southern Caribbean (Fig. 1). Microfossils of pollen and phytoliths, charcoal particulates, sediment chemistry, and a program of high-precision radiocarbon dating provide new evidence that first colonizers to the islands arrived earlier than previously thought. These first colonizers were modifying and perhaps managing landscapes that had implications for subsequent colonizing groups, including the larger Neolithic communities from greater Amazonia. Archaeological remains of these earliest colonists may be deeply buried under alluvial, colluvial, or volcanic deposits and in cases of coastally oriented people may be underwater due to rising sea level. Clearly, archaeological programs addressing early to mid-Holocene human occupations and land-use histories, especially in dynamic coastal settings, should systematically incorporate paleoenvironmental investigations.

Data from the current project inform on the full span of human history in the eastern Caribbean, from first colonization of the islands through the arrival of Europeans. In some areas, our data complement archaeological, paleoenvironmental, and historical findings from the Lesser Antilles and in others amplify understanding of colonization history. Results presented in this paper relate specifically to initial colonization history of the eastern Caribbean. In particular, data from Trinidad, Grenada, Martinique, and Marie-Galante (Guadeloupe) provide a basis for revisiting initial colonization models of the Caribbean (Fig. 1; Table 1).

Table 1
Locations of the cores discussed in the text.

Island, location	Core number	Northing[a]	Westing[a]
Trinidad, Nariva Swamp	NV08-1	1031.035	6102.603
Grenada, Meadow Beach	MB08-1	1209.728	6136.403
Grenada, Lake Antoine	12-VII-08	1211.011	6136.393
Martinique, Baie de Fort-de-France	KC08-1	1433.802	6059.677
Martinique, Pointe Figuier	PF08-1	1427.680	6054.558
Marie Galante, Vieux Fort	VF08-1	1558.697	6117.637

[a] Coordinates are in degrees, minutes, and seconds. Example: N1209.728 = N12°, 09 min, 72.8 s.

1.2. Methodological challenges and debates in identifying the earliest traces of human activities in the Caribbean

Models of prehistoric island colonization are generally based on data collected from archaeological sites (Alcover, 2008; Rouse, 1986; Siegel, 1991). While archaeological excavations are important it is increasingly apparent that many human activities leave only subtle traces, for which traditional methods of archaeological surveying, testing, and excavation may not be adequate for identification and assessment (Jones, 1994; Neff et al., 2006; Pohl et al., 1996; Pope et al., 2001). Paleoenvironmental investigations in the Caribbean are revealing the importance of systematically collecting

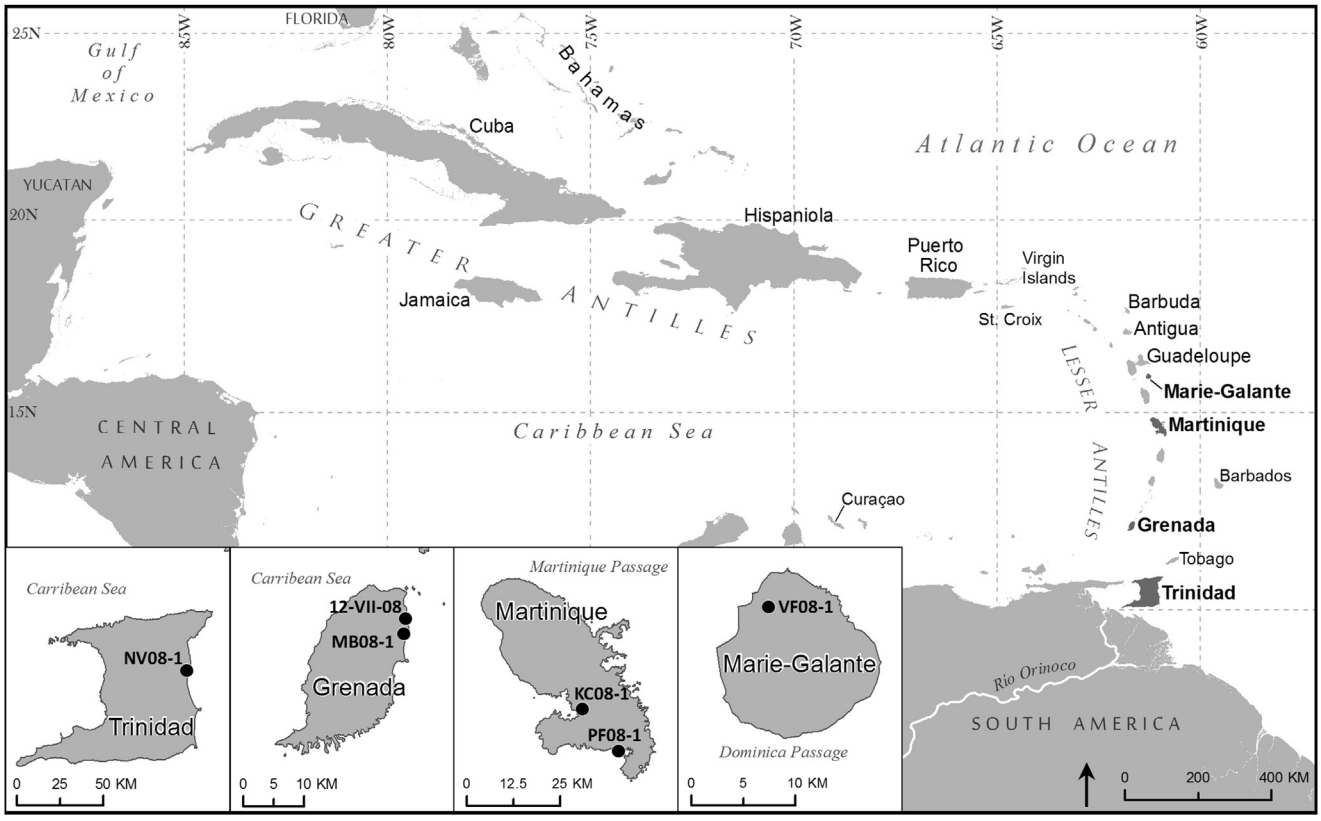

Fig. 1. Map of the Caribbean basin. Environmental cores were collected from Trinidad, Grenada, Curaçao, Barbados, Martinique, Marie-Galante, Antigua, Barbuda, and St. Croix. Cores discussed in this paper came from Trinidad, Grenada, Martinique, and Marie-Galante (inset).