Cookware and crockery: A form and functional view from the Southern Bahamas

Andy Ciofalo, Leiden University
Devon Graves, Leiden University

Society for American Archaeology
83rd Annual Meeting, 11-15 April 2018, Washington, DC.

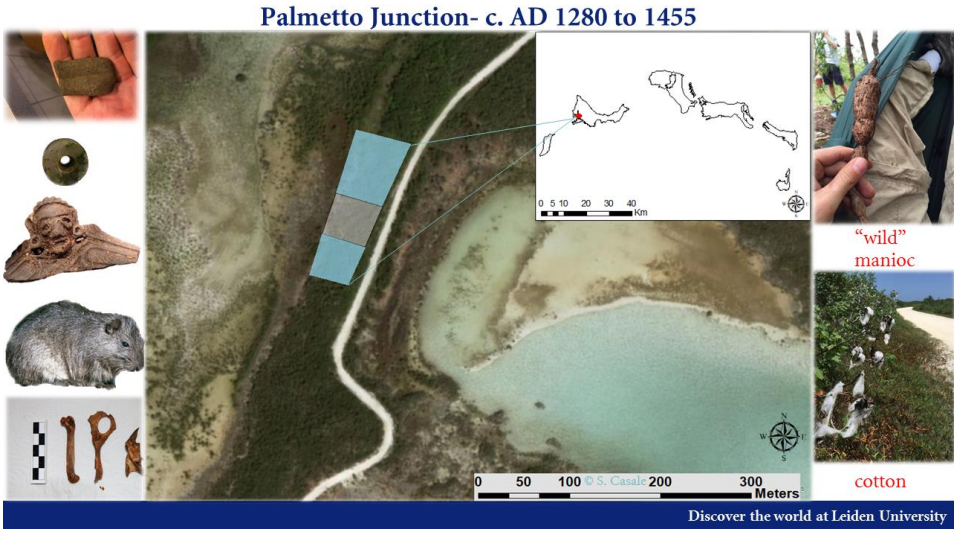
Abstract

Recent archaeobotanical research on the Palmetto Junction archaeological site located in Providenciales, Turks and Caicos Islands, has provided new insights into the livelihoods and subsistence practices of the peoples who inhabited this coastal region from c. AD 1280-1455. The microbotanical remains, identified primarily as originating from seeds and tubers, provide evidence for a continuation in the consumption and manipulation of traditional Antillean plant resources. During the late precolonial period, people used domesticated plants such as maize (*Zea mays* L.), sweet potato (*Ipomoea batatas* L.), and yam (*Dioscorea* spp.), and employed plant-processing techniques that permitted the consumption of otherwise inedible (poisonous) geophytes. Some of the pottery may have been used as serving vessels and others such as Palmetto-style griddles for cooking. Interpretations of foodway dynamics in this region will serve to build a unique Caribbean perspective of food patterns. In this regard, this research contributes to modern-day global appreciations of ancient foodways, which offer significance and meanings to both socially learned practices and other life-ways. An in-depth analysis covering the style and form of the Palmetto Junction pottery in conjunction with information from ancient starch grains creates a fuller interpretation of how the interrelationships amongst past human societies, plants, and material culture were entangled.

Introduction

The site of Palmetto Junction, which lies on the western end of Providenciales, Turks & Caicos Islands, gets its name from the profuse Palmetto Ware style pottery sherds covering the surface of the site. Currently, there are eight radiocarbon dates from Palmetto Junction, indicating the site was occupied from approximately A.D. 1280-1455 during the advent of European encounters (Sinelli, 2015). This site was discovered in 2004 during road construction, but excavations were not intensified until 2014. Since then, there have been four field seasons carried out by students from the University of Central Florida and the authors who research at Leiden University. For The Bahamas, this is a large archaeological site encompassing nearly 2 hectares of confirmed habitation and activity areas. There are two seemingly separate habitation zones, a northern area of the site containing a tentatively identified plaza with more than seventeen middens circling it, and a southern area of the site with more than five middens. The two habitation zones are separated by an extremely rocky central area, which is void of any surface artifacts. The middens of both areas of the site are of dense deposits containing hutia remains, pottery sherds, and other cultural artifacts. The pottery sherds present at Palmetto Junction are mainly of the Palmetto Ware style, native to The Bahamas and to a lesser extent, Chican and Meillacan styles are represented in the recovered assemblage. The presence of multi-stylistic pottery represented in every stratigraphic layer suggests the integration of Palmetto Junction into some scale of a trading network or meeting hub throughout its occupancy. While there was never any recorded or observed land development historically near the site besides a partial road, there is cotton, manioc (*Manihot esculenta* Crantz), chili pepper (*Capsicum* spp.), and possibly sweet potato (*Ipomoea batatas* (L.) Lam.) currently growing at the site; plausibly cultivated by

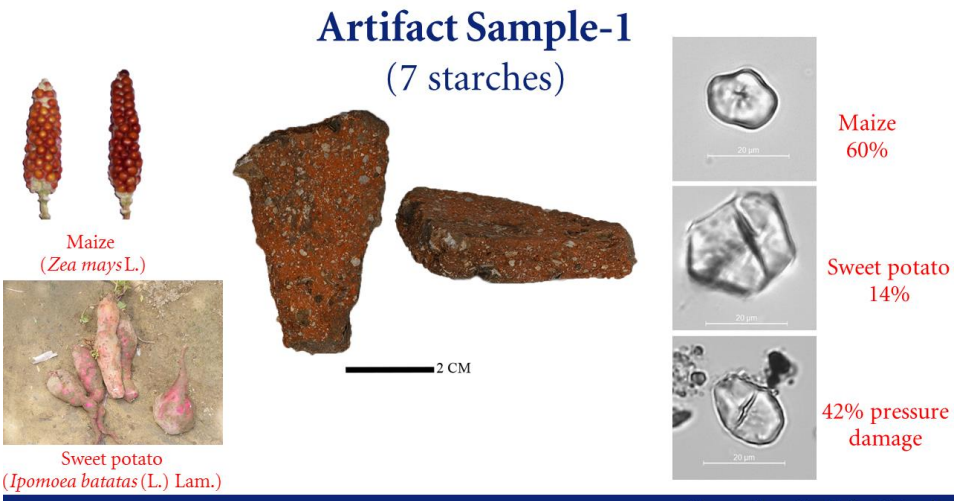
indigenous people of the island. The location of Palmetto Junction is ideally positioned to maximize access to local clay, botanical, and animal resources, and to facilitate contact with people further North in The Bahamas and further South in the Greater Antilles.



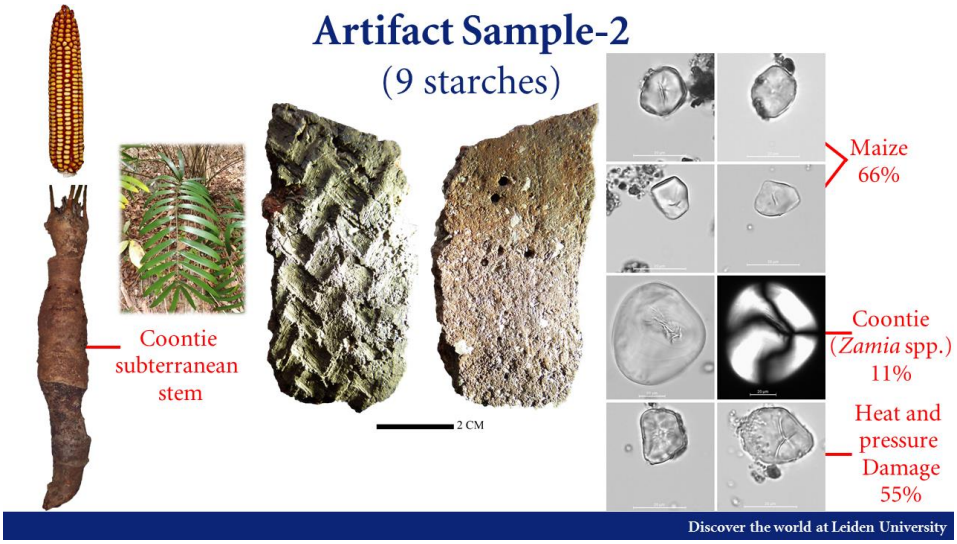
Identified plants

From this study, the identified starch grains originated in botanicals that were primarily edible seeds and tubers. The next section discusses three exemplary artifact samples, where they were excavated from, what types of pottery starch was recovered from, and the plants identified through analysis.

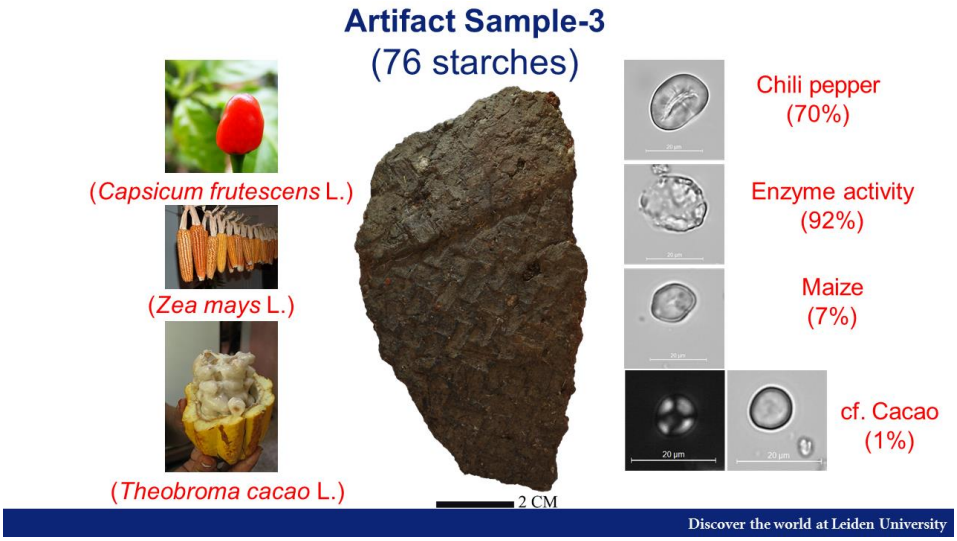
Results



Artifact Sample-1 was excavated from a southern area midden and determined to be of the Palmetto Plain Ware style, which is the most common type of pottery found at this site. This sherd would have belonged to a vessel due to the curvature and thinness, as it is less than 16mm thick (Granberry and Winter, 1995). The vessel did not have slip, but was coiled, scraped, and then smoothed with no burnishing. Unfortunately, the sherd is too small to determine what part of vessel it was from, and is partially eroded on what would have been the interior side of the vessel. To create this vessel, Bahama red loam was mixed with large shell inclusions, smaller clay pellets, and limestone. Nearly all of the temper represented in the ceramic is shell, and the pottery is heavily tempered. Coarse shell temper used in the pottery suggests that it could have been preferred to have been used as a cooking pot, as large amounts of shell temper help to increase a vessel's resistance to stress, ideal for vessels that are to be used consistently in a hot cooking environment (Bate, 2011:161). The identified starch grains were predominantly maize (*Zea mays* L.) (4), with one starch tentatively ascribed as sweet potato. Almost thirty percent of the starch grains (7) were affected by heat alterations from dry cooking environments (sensu Henry, et al., 2009). Forty-two percent of the starches were modified by applications of pressure.



Artifact Sample-2 is from the same midden as sample-1, but Sample-2 was part of a Palmetto Mat Marked style vessel, the second most common pottery type found at Palmetto Junction and the most common type of decoration found on Palmetto Ware style pottery at this site. Traditionally, Palmetto Mat Marked style pottery consists of both flat griddles and bowl shaped vessels with mat marks or basketry impressions applied to the surface, found on the non-cooking surfaces of griddles and occasionally the bottom half of vessel forms. It is thought that Palmetto Mat Marked style pottery used woven mats or baskets in order to keep them together more easily while drying, interpreting that the decoration is a part of the manufacturing process (Sears and Sullivan, 1978). However, this may always have been the case considering how deep the impressions are in the pottery and the fact that they were left instead of smoothed over. For the purpose of this paper, we will refer to the Mat Marked style impressions as weaving marks, as it is not clear if these impressions were made from a mat or from basketry. Sample-2 varies from the norm of Palmetto Weaving Marked style because it was burnished on both sides, but less so on the weaving marked exterior possibly for the purpose of keeping the impressions definitive. This sherds also contains the high frequency of coarse shell temper like Artifact Sample- 1, presumably so that the vessel could withstand repeated use for cooking. Sixty-six percent of the recovered starch grains recovered from sample-2 (9) have been securely identified as maize. One starch grain has sufficient characteristics to ascribe it to the genus level of (Zamia) known as coontie in The Bahamas. More than half of the starch grains recovered from this artifact were affected by dry heat and/or pressure. In most of the cases, the pressure seems to have been manifested from pounding, evinced from central cracks and striations on the starch grains (Mickleburgh and Pagán-Jiménez, 2012).



Finally, Artifact Sample-3 comes from an adjacent excavation unit used to explore more of the same southern midden. This sherd was part of a Palmetto Ware Weaving Marked style vessel, and it has weaving marks on the exterior, appearing to be from two different impressions with one weaving mark pressed much further into the vessel than the other. This has created a line in the vessel and two different distinct thicknesses of clay, which is the only sherd in Palmetto Junction's assemblage with these traits recovered thus far. There is no burnishing on this sherd, and it appears that the inside was smoothed as a surface finish. The clay fabric of this sherd has less tempering than artifact samples 1 and 2, and a slightly finer paste. The starch grain analysis revealed more than 75 starches, with the majority (53, 70%) being identified to the genus level of chili pepper. Seven percent (5) have sufficient features to be ascribed to the species level of maize. One percent (1 or 2) starches could be identified as cf. *Theobroma cacao* L., which leads to the possibility this vessel was used to hold a chocolate beverage that was spiced with chili and sweetened with maize. Ninety-two percent of all of the starches exhibit alterations due to the early stages of fermentation, and so far, no other starches from the same excavation unit and level exhibit signs of enzyme degradation, suggesting the enzyme degradation of the starches on this sherd occurred predepositionally. There was a charred remains area noticed while sampling for starch on the interior of the vessel, although no starches had evidence of being modified by heat, which could mean the heat used which produced the charred area was low temperature and typical of the fermentation process for beverages (Dias, et al., 2007).

Commented [XYZ1]: This was not presented at the SAA in 2018 but deemed necessary to report in this version of the document.

Palmetto Junction Ubiquity Analysis SAA 2018

Starch grains identified from 43 clay cooking vessels

Plants	Ubiquity %	Potential Foodways Rank
Subterranean organs		
manioc	2%	5
zamia	5%	4
arrowroot	2%	5
sweet potato	12%	2
cocoyam	2%	5
yam	12%	2
Fruits		
chili pepper	7%	3
Seeds		
maize	33%	1

Yam and sweet potato were cooked in pots

These households processed a broad suite of root crops

Discover the world at Leiden University

Ubiquity refers to the occurrence of identified taxa amongst the sample spectra. In sum, 43 clay artifacts have been analyzed. The three most ubiquitous plants represented on this analyzed assemblage were maize, sweet potato, and yam. Secondary plants identified were chili pepper, arrowroot (*Maranta arundinacea* L.), cocoyam (*Xanthosoma sagittifolium* (L.) Schott), Manioc, and plants from the genus *Zamia* which are known as Coontie in The Bahamas.

Thirty-three percent of the artifacts (14) had maize recovered from their used surfaces, 12 percent (5) had evidence of sweet potato, and another 12 percent (5) had evidence of processed yam. While the ubiquity of maize and sweet potato were expected based on other studies from the Caribbean, the presence of yam, as one of the most ubiquitous plants represented in this assemblage was partially unexpected, although yam has been a consistent secondary food source in other studies of starchy foodways in the Caribbean (Pagán-Jiménez, 2007, Pagán-Jiménez, 2011, Pagán-Jiménez, 2013). In addition, the minor role that coontie played (5% ubiquity) in the represented starchy diet was unanticipated due to its significant ubiquity in other studies (Pagan and Oliver 2008; Pagan 2011).

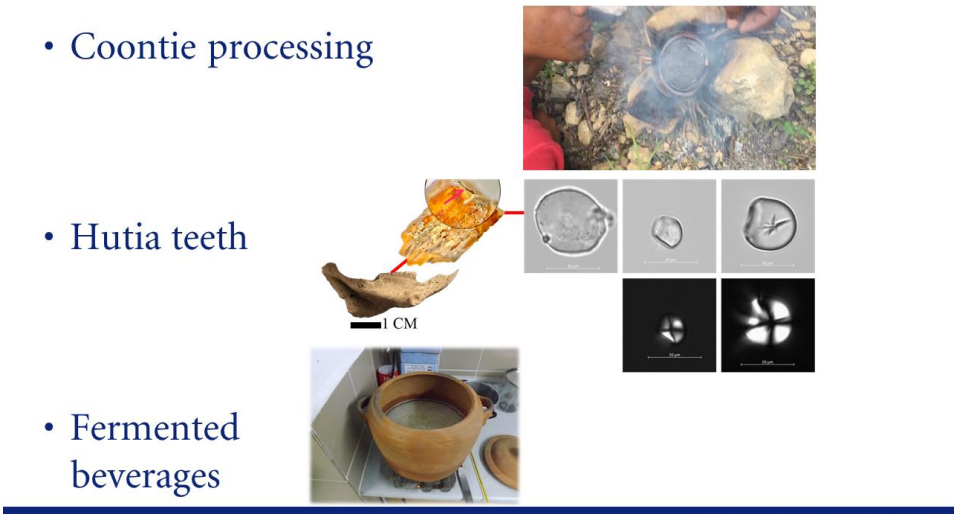
Discussion

When the data from the starch and macrofabric analyses are combined we can confidently determine Artifact sample-1 and 2 were designed and used as cooking vessels with the common recovered ingredient identified as maize. Previously maize has been regarded as a minor

economic botanical resource or even as a high-status food source (e.g. Newsom, 2006, Newsom and Wing, 2004:155, Rouse, 1992:12, Sturtevant, 1969). However, the ubiquitous use of maize at Palmetto Junction adds to the mounting evidence from other archaeobotanical studies throughout the Caribbean indicating maize was not restricted as a high-status food source nor was it of minor economic importance (Mickleburgh and Pagán-Jiménez, 2012, Pagán-Jiménez, 2007, Pagán-Jiménez, et al., 2015).

Ethnohistoric accounts have stated that sweet potato was one of the botanical dietary staples (Fernández de Oviedo y Valdés, 1959 [1526]:136, Sauer, 1966:54). There have been macro and microbotanical remains tentatively identified as sweet potato recovered from sites in the Greater Antilles (Newsom and Wing, 2004:154, Newsom and Pearsall, 2003, Chinique de Armas, et al., 2015). Thus, it is not strange to find botanical remains of sweet potato in The Bahamas as was the case in this study; in fact, the unusual part is the absence of sweet potato from other archaeobotanical research in The Bahamas, which was possibly due to the size of the other studies' artifact assemblage (Berman and Pearsall, 2000, Berman and Pearsall, 2008, Perry, et al., 2007).

While coontie was not recovered from a statistically significant proportion of the pottery, the processing of this plant demonstrates the depth of the technological abilities at Palmetto Junction to process poisonous but nutritious food sources. Coontie produces a powerful neurotoxin (cycasin), which must be extracted before humans and other animals can consume the prepared food (Dickau, 2005:262). To remove the toxins, dough made from the plant is left outside until it is filled with fly larvae that neutralize the poison which are then baked into the bread and add more nutrients especially protein (Las Casas, 1909).

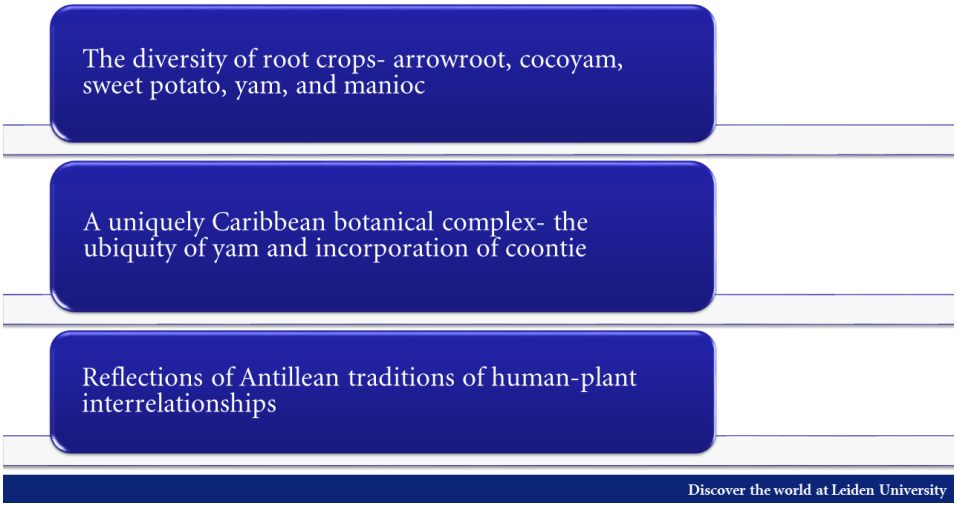


Recently, in the Caribbean, pieces of coontie's subterranean stem have been used as rat poison (Veloz Maggiolo, 1992). At Palmetto Junction, we have recovered an unparalleled

frequency of hutia remains, and a starch analysis from hutia dental calculus provided evidence that the hutia was eating coontie, maize, and manioc. These plants must have been processed before the hutia ate the foods as both coontie and manioc can be poisonous and the maize starch grains were affected by heat. With this analysis, it is impossible to determine if the hutia were purposely fed by humans or if they were eating discarded waste from the trash.

Hutia were an economically important food source possibly used for feasts (Wing, 2001). Other feasting ingredients include chili pepper and maize, which are known to have been combined in highly regarded fermented beverages during precolonial times in the circum-Caribbean and used to celebrate ceremonies (Green, 2010, Landa, 1941 [1566], Soleri, et al., 2013). Due to the identified plants from Artifact Sample-3, the lack of heat-affected starches, and the proportion of enzyme-degraded starches, this vessel was likely used to prepare fermented botanical beverages. Additional investigations should be carried out and more lines of evidence are needed before further comments on feasting episodes at Palmetto Junction are made.

Final Remarks



The starches of poisonous manioc and coontie recovered from cooking implements are a testament to the phyto-technological abilities of the people preparing food at Palmetto Junction. The presence of arrowroot, cocoyam, sweet potato, manioc, and yam support the idea that the precolonial Bahamians at this habitation were in fact processing and consuming a diversity of root crops, which is a partial representation of the starchy species of the so-called “lowland agricultural complex” (Pearsall, 2006). However, the ubiquity of yam and the incorporation of coontie and cocoyam make the detected botanical complex uniquely Caribbean. The variety of seed, fruit, and tuberous plants recovered from the cookware are indicative of broad-spectrum subsistence strategies, countering the colonial Spanish assertion that the staple botanical food

sources of the indigenous Caribbean people were manioc and sweet potato. Furthermore, arrowroot was processed and used during precolonial times, and not introduced during European encounters as (Sturtevant, 1969) contends. In addition, Alexander and Coursey (1969) assert that yams were a secondary food source in the Caribbean, from this study this does not appear to be the case, at least for the inhabitants and visitors of Palmetto Junction. Based on collated information, the inhabitants of Palmetto Junction were descendants of immigrants who arrived to the Greater Antilles centuries or millennia before, eventually inhabiting The Bahamas, who mastered the production of maize, sweet potato, and yam foods combining them with other consumption practices rooted in Antillean traditions of human-plant interrelationships.

References

Sinelli, P.T., 2015. Migrating Meillacoid, or: How I learned to Stop Worrying and Love the Bahamas, in: Velasquez, C.B., Haviser, J.B. (Eds.), 25th Congress of the IACA, Sint Maarten.

Granberry, J., Winter, J., 1995. Bahamian ceramics, Proceedings of the XV International Congress for Caribbean Archaeology, , Centro de Estudios Avanzados de Puerto Rico y el Caribe, San Juan, pp. 3-14.

Bate, E., 2011. Technology and Spanish Contact: Analysis of Artifacts from the Long Bay Site, San Salvador Island, The Bahamas, Department of Anthropology, Indiana University, Bloomington.

Henry, A.G., Hudson, H.F., Piperno, D.R., 2009. Changes in starch grain morphologies from cooking, Journal of Archaeological Science 36, 915-922.

Sears, W.H., Sullivan, S.O., 1978. Bahamas Prehistory, American Antiquity 43, 3-25.

Mickleburgh, H.L., Pagán-Jiménez, J.R., 2012. New insights into the consumption of maize and other food plants in the pre-Columbian Caribbean from starch grains trapped in human dental calculus, Journal of Archaeological Science 39, 2468-2478.

Dias, D.R., Schwan, R.F., Freire, E.S., Serodio, R.D., 2007. Elaboration of a fruit wine from cocoa (Theobroma cacao L.) pulp, International Journal of Food Science and Technology 42, 319-329.

Pagán-Jiménez, J.R., 2007. De antiguos pueblos y culturas botánicas en el Puerto Rico indígena: el archipiélago borincano y la llegada de los primeros pobladores agroceramistas, Paris Monographs in American Archaeology Series 18, British Archaeological Reports International Series 1687, Archaeopress, Oxford.

Pagán-Jiménez, J.R., 2011. Early phytocultural processes in the pre-Colonial Antilles, in: Hofman, C.L., Van Duijvenbode, A. (Eds.), Communities in Contact: Essays in Archaeology, Ethnohistory, and Ethnography of the Amerindian circum-Caribbean. Sidestone Press, Leiden, Sideston Press, Leiden, pp. 87-116.

Pagán-Jiménez, J.R., 2013. Human–Plant Dynamics in the Precolonial Antilles, in: Keegan, W.F., Hofman, C.L., Rodríguez Ramos, R. (Eds.), The Oxford Handbook of Caribbean Archaeology, Oxford University Press, New York, pp. 391-406.

Newsom, L.A., 2006. Caribbean Maize First Farmers to Columbus, in: Staller, J., Tykot, R., Benz, B. (Eds.), Histories of Maize in Mesoamerica: Multidisciplinary Approaches, Academic Press, Amsterdam, pp. 325-343.

Newsom, L.A., Wing, E.S., 2004. On land and sea: Native American uses of biological resources in the West Indies, University of Alabama Press, Tuscaloosa.

Rouse, I., 1992. The Tainos, Rise and decline of the people who greeted Columbus, Yale University Press, New Haven.

Sturtevant, W.C., 1969. History and ethnography of some West Indian starches, in: Ucko, P.J., Dimbleby, G.W. (Eds.), The Domestication and Exploitation of Plants and Animals, Gerald Duckworth & Co. Ltd., London, pp. 177-199.

Pagán-Jiménez, J.R., Rodríguez-Ramos, R., Reid, B.A., van den Bel, M., Hofman, C.L., 2015. Early dispersals of maize and other food plants into the Southern Caribbean and Northeastern South America, Quaternary Science Reviews 123, 231-246.

Fernández de Oviedo y Valdés, G., 1959 [1526]. Natural history of the West Indies, University of North Carolina Press, Chapel Hill.

Sauer, C.O., 1966. The Early Spanish Main, University of California Press., Berkley and Los Angeles, California.

Newsom, L.A., Pearsall, D.M., 2003. Temporal and spatial trends indicated by a survey of archaeobotanical data from the Caribbean Islands, in: Minnis, P. (Ed.), People and Plants in Ancient North America, Smithsonian Institution press, Washington D.C.

Chinique de Armas, Y., Buhay, W.M., Rodríguez Suárez, R., Bestel, S., Smith, D.G., Mowat, S.D., Roksandic, M., 2015. Starch analysis and isotopic evidence of consumption of cultigens among fisher–gatherers in Cuba: the archaeological site of Canímar Abajo, Matanzas, Journal of Archaeological Science 58, 121-132.

Berman, M., Pearsall, D.M., 2000. Plants, People, and Culture in the Prehistoric Central Bahamas: A View from the Three Dog Site, an Early Lucayan Settlement on San Salvador Island, Bahamas, Latin American Antiquity 11, 20.

Berman, M., Pearsall, D.M., 2008. At the crossroads: Starch grain and phytolith analyses in Lucayan prehistory, Latin American Antiquity 19, 181-203.

Perry, L., Dickau, R., Zarrillo, S., Holst, I., Pearsall, D.M., Piperno, D.R., Berman, M., Cooke, R.G., Rademaker, K., Ranere, A.J., Raymond, J.S., Sandweiss, D.H., Scaramelli, F., Tarble, K., Zeidler, J.A., 2007. Starch fossils and the domestication and dispersal of chili peppers (Capsicum spp. L.) in the Americas, Science 315, 986-988.

Dickau, R., 2005. Resource use, crop dispersals, and the transition to agriculture in prehistoric Panama: evidence from starch grains and macroremains, Department of Anthropology, PhD. Diss., Temple University.

Las Casas, B.d., 1909. Apologetica historia de las Indias, Bailey-Ballière e Hijos Madrid.

Veloz Maggiolo, M., 1992. Notas sobre la Zamia en la Prehistoria del Caribe, Revista de Arqueología Americana 6, 125-138.

Wing, E.S., 2001. The sustainability of resources used by Native Americans on four Caribbean islands, International Journal of Osteoarchaeology 11, 112-126.

Green, J.S., 2010. Feasting with foam: Ceremonial drinks of cacao, maize, and pataxte cacao, in: Staller J.E., Carrasco M.D. (Eds.), Pre-Columbian Foodways, Springer, New York, pp. 315-343.

Landa, D.d., 1941 [1566]. Landa's Relación de las Cosas de Yucatán, Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge.

Soleri, D., Winter, M., Bozarth, S.R., Hurst, W.J., 2013. Archaeological Residues and Recipes: Exploratory Testing for Evidence of Maize and Cacao Beverages in Postclassic Vessels from the Valley of Oaxaca, Mexico, Latin American Antiquity 24, 345-362.

Pearsall, D.M., 2006. The origins of plant cultivation in South America, in: Cowan, C.W., Watson, P.J., Benco, N.L. (Eds.), The Origins of Agriculture: An International Perspective, The University of Alabama Press, Tuscaloosa, pp. 173-206.

Alexander, J., Coursey, D.G., 1969. The origins of yam cultivation, in: Ucko, P.J., Dimbleby, G.W. (Eds.), The origins of yam cultivation., Gerald Duckworth & Co. Ltd., London, pp. 405-426.