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Lapidary craftsmanship in the Antilles during the Ceramic Period, a renewed and updated analysis.

Artisanat lapidaire dans les Antilles durant la période Céramique, mise à jour et renouveau

La artesanía lapidaria en las Antillas durante el periodo cerámico, actualización y resurgimiento

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Very diverse lapidary artwork, both in style and raw materials, is one of the recognized specialty of Amerindian crafting during the Saladoid period in the Antilles area, and is thought to be less numerous and diverse in the following periods. These gemstones are very often referred to as “*exotic*” since they are not coming from the island where they have been discovered by archaeological excavations. Our recent work updates the previous data by studying newly excavated sites as well as refining ancient mineral characterizations. Exhaustive results for the French islands, combined to a literature-based database, allowed for the creation of an improved and renewed vision of the distribution of these numerous artifacts. Such an important database finally allows us to study the patterns in the lapidary production of the Ceramic Age in the Caribbean, both in terms of chronology and typology. This study lays the foundation for further work in the region, and present online tools developed with the aim of creating new collaborations on this subject.

Les parures en pierre, très diverses, tant par le style que par les matières premières, constituent l'une des spécialités reconnues de l'artisanat amérindien de la période saladoïde dans la zone des Antilles, et sont réputées moins nombreuses et diversifiées aux périodes suivantes. Ces pierres précieuses sont très souvent qualifiées d'“*exotiques*” car elles ne proviennent généralement pas de l'île où elles ont été découvertes. Notre travail récent met à jour les données précédentes en étudiant les sites nouvellement fouillés ainsi qu'en affinant les caractérisations minérales anciennes. Des résultats exhaustifs pour les îles françaises, combinés à une base de données bibliographique, ont permis de créer une vision enrichie et renouvelée de la distribution

de ces nombreux artefacts. Cette importante base de données nous permet enfin d'étudier les schémas de la production lapidaire de l'âge Céramique dans la Caraïbe, tant en termes de chronologie que de typologie. Cette étude jette les bases de travaux à venir dans la région, et présente des outils en ligne, développés dans le but de créer de nouvelles collaborations sur ce sujet.

Las obras de arte lapidarias muy diversas, tanto en estilo como en materias primas, son una de las especialidades reconocidas de la artesanía amerindia durante el periodo saladoide en la zona de las Antillas, y se supone que son menos numerosas y diversas en los periodos siguientes. Estas piedras preciosas se califican muy a menudo de “*exóticas*”, ya que no proceden de la isla donde han sido descubiertas por las excavaciones arqueológicas. Nuestro reciente trabajo actualiza los datos anteriores mediante el estudio de los nuevos yacimientos excavados, así como el perfeccionamiento de las caracterizaciones minerales obsoletas. Los resultados exhaustivos para las islas francesas, combinados con una base de datos basada en la literatura, han permitido crear una visión mejorada y renovada de la distribución de estos numerosos artefactos. Esta importante base de datos nos permite finalmente estudiar los patrones de la producción lapidaria de la Edad de la Cerámica en el Caribe, tanto en términos de cronología como de tipología. Este estudio sienta las bases para futuros trabajos en la región, y presenta herramientas en línea desarrolladas con el objetivo de crear nuevas colaboraciones en este tema.

Introduction

If the study of ceramic production is at the foundation of Caribbean archaeology and the production of shell tools and ornaments exceeds in quantity the production of these same objects made of stone during the Ceramic period, it must be noted that the study of lithic raw materials has also been included since the 1990s as one of the approaches that allows us to understand questions of territory and interactions between groups (Knippenberg, 2007; Rodriguez and Rivera, 1991; Rodriguez Ramos, 2010; Watters, 1997).

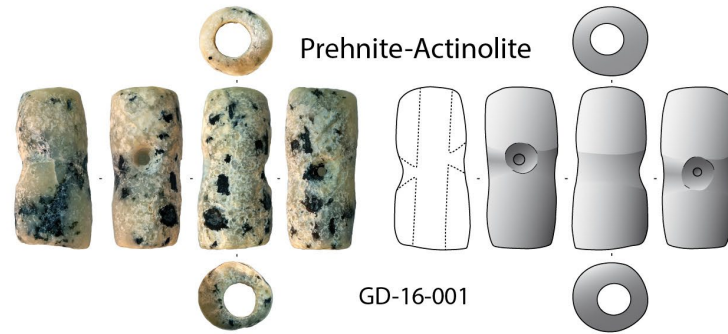
Within these stone material productions, ornamental objects such as beads and pendants have been the subject of a relatively large number of work (Boomert, 1987; Cody, 1993; Crock and Bartone, 1998; Harrington, 1924; Murphy et al., 2000; Narganes Storde, 1999, 1995; Rodriguez, 1991; Roobol and Lee, 1976). However, the Caribbean islands form a fragmented, varied environment, both in terms of geology and geography, but also in terms of our knowledge of Amerindian lapidary production. In order to consolidate our knowledge about this part of the archaeological record, and to integrate into the archaeological corpus the lapidary productions found in the sites of the French Caribbean islands, recent data have been produced for the lapidary artifacts coming from several archaeological sites such as Gare Maritime (Queffelec et al., 2018), Vivé, Morel and Anse à la Gourde (Queffelec et al., 2020a). These data incorporate mineralogical characterizations and comprehensive iconographic documentation, and supplement to a pioneering work on Antigua (Murphy et al., 2000) and recent work published for Pearls and several Dominican Republic sites (Falci et al., 2020b, 2020a). Combining these robust data and extensive bibliographic research, it has been possible to create an integrated database for Ceramic age lapidary ornaments in the Antilles that will allow for a better understanding of the geographical, temporal and cultural dynamics associated with these particular material productions in the future.

Results

Recent work in the French islands of the Antilles has made it possible to inventory, document and characterize the entire production of stone ornaments from the Ceramic period. This includes the Early Ceramic sites of Gare Maritime, Vivé, Morel and Hope Estate, as well as the Late Ceramic site of Anse à la Gourde (Queffelec et al., 2020a, 2020b, 2018). In addition to these sites, which have yielded several dozen objects and have been published elsewhere, many sites that yielded smaller numbers of artifacts have also been studied (Figures 1-5). This further highlighted the diversity of materials and types of artefacts produced, particularly in Early Ceramics: beads, pendants, bead-pendants, made of carnelian, diorite, amethyst, serpentine, calcite and other gems. All these objects were subjected to mineralogical characterization, mainly by Raman spectroscopy, but also by other methods when necessary. These analytical approaches have been particularly important in clarifying the mineralogical natures of the rocks used by the Amerindians. This is illustrated, for example, by the demonstration of the use of sudoite, a mineral of the chlorite family, for the production of several objects found in several archaeological sites. This material, unknown in the world as a gemstone, was thus the subject of a particular study in order to confirm this gemological attribution (Queffelec et al., 2021a).

GUADELOUPE

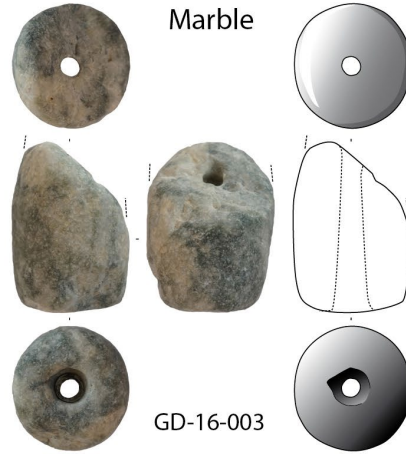
Anse Vinaigri



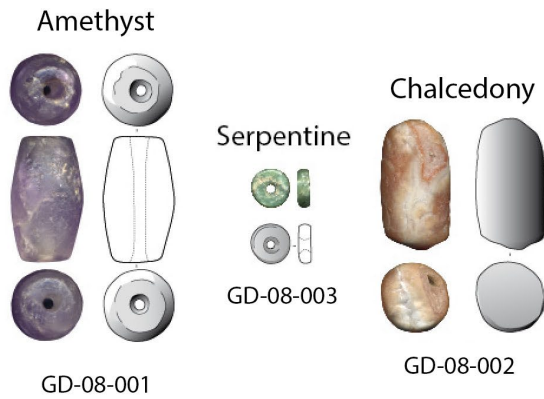
Limestone



Marble



Anse Ste-Marguerite



Butel



Figure 1. Photos and technical drawings of lapidary artifacts from diverse archaeological sites in Guadeloupe (Anse Vinaigri, Anse Ste Marguerite and Butel)

GUADELOUPE

Anse à la Barque

Volcanic rock



GD-06-001

**Anse-Bertrand
surface
collection**

Chalcedony



GD-07-001

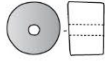


Figure 2. Photos and technical drawings of lapidary artifacts from diverse archaeological sites in Guadeloupe (Anse à la Barque and Anse Bertrandl)

GUADELOUPE

Ilet Gosier

Clinozoisite



GD-12-001

Grand Carbet

Carnelian



GD-11-001

0 5 cm

Les Mineurs

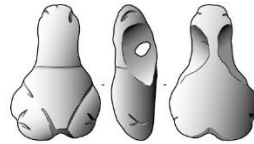
Carnelian



GD-13-001

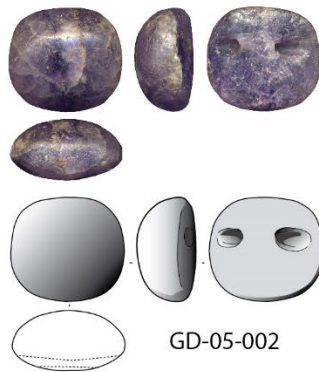
Cathédrale Basse-Terre

Sudoite



GD-09-001

Allée Dumanoir



GD-05-002

Amethyst



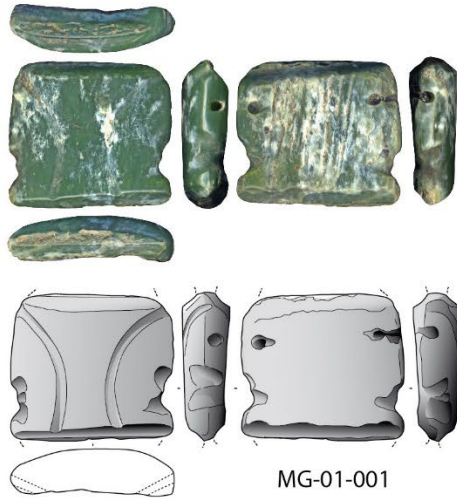
GD-05-001

Figure 3. Photos and technical drawings of lapidary artifacts from diverse archaeological sites in Guadeloupe (Ilet Gosier, Grand Carbet, Les Mineurs, Cathédrale Basse-Terre, Allée Dumanoir)

GUADELOUPE

Cocoyer

Nephrite



Stade José Bade

Diorite



Anorthite



Volcanic rock



Variscite



Cadet 2

Anorthite



Morne Cybèle

Diorite



Petite Rivière

Calcite



Anorthite

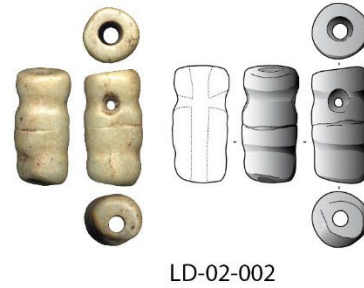


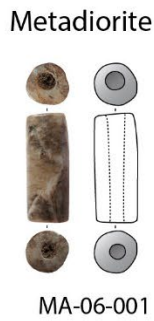
Figure 4. Photos and technical drawings of lapidary artifacts from diverse archaeological sites in Marie-Galante (Cocoyer, Stade José Bade, Cadet 2) and La Désirade (Morne Cybèle, Petite Rivière)

MARTINIQUE

Anse Trabaud



Rue Pory-Papy



Macabou



Le Diamant



Rue Perrinon-Doume



Figure 5. Photos and technical drawings of lapidary artifacts from diverse archaeological sites in Martinique (Anse Trabaud, Rue Pory-Papy, Macabou, Le Diamant, Rue Perrinon-Doume)

All these first-hand data and data from an intensive bibliographic search were integrated into a database. The structure of this database is based on 4 tables (islands, sites, beads, sources) and has been published in a dedicated article (Queffelec et al., 2021b) following recommendation by Peer Community In Archaeology (Marwick, 2021). The coding system in the database (also used in Figures 1 to 5) is constructed as follows. It starts with two letters corresponding to the island on which it was found, followed by a two-digit number corresponding to the number of the site on that island, and finally a three- or four-digit number representing the number of the object in that site. Thus, object GD-02-003 corresponds to the third object (003) studied from Morel (02), an archaeological site located in Guadeloupe (GD). In order to disseminate this information to all interested researchers, online tools were used. This database is available online in English and French as a spreadsheet (<https://osf.io/qbnkm> and <https://osf.io/zpwt8> respectively), and in the form of a Filemaker online database (Figure 6) accessible at this address: https://fm02.db.huma-num.fr/fmi/webd/PACEA_PAAF (clic on « se connecter en tant qu'invité » below the blue button and use the quick search bar for example). The geographical distribution of these lapidary artifacts can also be viewed on the online geographic information system (GIS) platform ArkeoGIS (Figure 7) (<https://arkeogis.org/en/>), and it can be interrogated on OPENARCHAEO (<http://openarchaeo.huma-num.fr/explorateur/home>). Users must register first to access this geographical application, since it is controlled in order to prevent archaeological looting. We hope to disseminate this work, share it with the scientific community and, if possible, bring together colleagues with other primary data at their disposal.

The screenshot displays the online database interface for artifact MA-02-037. At the top, there is a search bar with 'Martinique' entered and a navigation bar showing 'Trouvés 49 / 8128'. Below this, a filter bar includes fields for 'Site' (Vivé), 'Island' (Martinique), 'Date_calibrated', 'Date_BP', 'Period' (Early Ceramic), 'Cultural component' (Early Cedrosan Saladoid), 'Type_site' (Habitat), 'Ref_biblio_1' (Bérard_2004), 'Longitude' (-61,082725), 'Structure' (zone 1), 'Ref_biblio_2', and 'Latitude' (14,847667). The main content area is divided into tabs: 'General', 'Advanced', and 'Island/Site'. The 'General' tab is active, showing the 'INDEX' as 'MA-02-037'. On the left, a list of fields includes 'Object' (Bead), 'Type' (Discoid), 'Progress' (Finished), 'State' (Complete), 'Weight' (.6), 'Bead_Length' (3), 'Bead_Dia_max' (10,5), 'Bead_Dia_min' (11,6), 'Pend_height', 'Pend_width', 'Pend_thickness', 'Blank_Length', 'Blank_width', 'Blank_Thickness', 'Nb_Perforation' (1), 'Pos_Perforation' (Longitudinal), 'Shape_perforation' (Tronconical), and 'Perfo_Dia' (2,513). In the center, there is a 'STRATI' section with fields for 'US', 'Square' (C12), 'Level', and 'Z'. Below this, 'Gem_material' is set to 'Turquoise', and other fields like 'Colour', 'Mineral_1', 'Mineral_2', 'Mineral_3', 'Other_RawMat', 'Method_carac', and 'Provenance_proposed' are empty. On the right, two photographs of the artifact are shown with 1cm scale bars. The top photo shows three views of a turquoise bead with a hole. The bottom photo shows two views of a grey bead with a hole. A 'RawMat_estim' field is also present at the bottom right.

Figure 6. Screenshot of one of the entries in the online database (artifact MA-02-037).

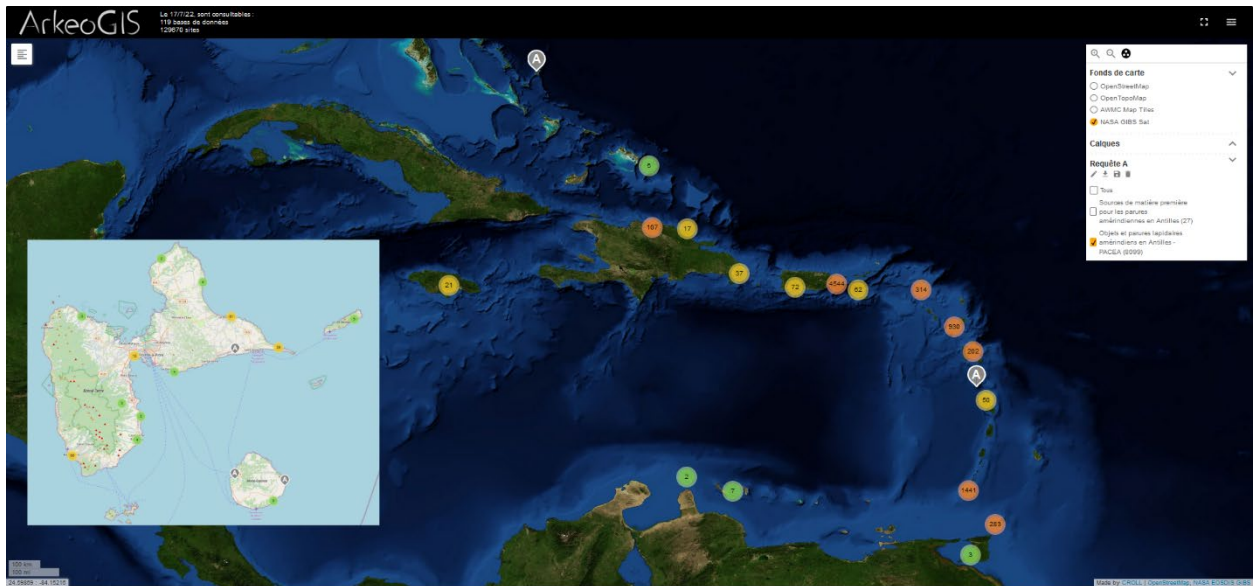


Figure 7. Screenshot of the geographical distribution of lapidary artifacts on the ArkeoGIS platform.

This work has so far identified 8103 artifacts from 95 sites (Table 1), spread over the entire Caribbean arc (Figure 8). Concerning the sites located on the French islands, some of which unpublished, it has been possible to identify 21 of them in the Guadeloupe - Marie-Galante - La Désirade archipelago, 7 in Martinique, and 5 in Saint-Martin (Figure 9). Despite some difficulties in attributing a specific archaeological period of the Ceramic age for some artifacts or even some sites, the distribution of the number of sites and objects for each period shows an extremely marked preference for the Early Ceramic and, to a lesser extent, the Middle Ceramic period (Figure 10). It is interesting to compare this pattern with the number of known archaeological sites in the Caribbean Arc, which increases between the Early and Late Ceramic periods (Curet, 2005; Hofman, 2013; Keegan and Hofman, 2017), what reinforce the fact that there is a high concentration of site and artifacts in the earlier period.

Table 1. List of archaeological sites currently included in the database.

Island	Site	Period	Culture	Number of artifacts	Reference
Anguilla	Whitehead's Bluff	Archaic	Casimiroïde / Ortoïroïde	2	Crock_2019
Antigua	Elliot's (PH-03)	(Middle?) Ceramic	Middle Cedrosan Saladoid	64	Murphy-etal_2000
Antigua	Mill Reef (PH-01)	Late Ceramic	Mamoran Troumassoid (Mill Reef)	2	Hoffman_1970
Antigua	Royall's (JO-11)	(Middle?) Ceramic	Middle Cedrosan Saladoid	199	Murphy-etal_2000
Antigua	Doig's (PA-15)	Early/Middle Ceramic	Early/Middle Cedrosan Saladoid	43	Gent&deMille_2003
Antigua	Winthorpe Bay	(Middle?) Ceramic	Middle/Late Cedrosan Saladoid	1	deMille-etal_1999
Aruba	Tanki Flip	Late Ceramic	Dabajuroïd	2	Rostain_1995
Barbuda	Seaview	Early/Middle Ceramic	Early/Middle Cedrosan Saladoid	18	Kendall-etal_2011
Bahamas	Minnis-Ward	Late/Final Ceramic	Lucayan	1	Blick-etal_2010
Bonaire	Wanapa	Ceramic		3	Haviser_1990
Carriacou	Grand Bay	(Middle?) Ceramic	Late Cedrosan Saladoid	17	Sutty_1990
Curacao	De Savaan	Ceramic		4	Haviser_1990
Dominique	Soufrière	Early Ceramic	Early Cedrosan Saladoid	1	Bérard_2009
Guadeloupe	Gare maritime	Early Ceramic	Huecan Saladoid	59	Romon-etal_2013
Guadeloupe	Morel	Early/Middle Ceramic	Cedrosan Saladoid/huecan	61	Delpuech-etal_1996
Guadeloupe	Anse à la Gourde	Late Ceramic	Troumassoid	28	Delpuech-etal_1997
Guadeloupe	24 rue Schoelcher	Early Ceramic	Early Cedrosan Saladoid	1	Etrich_2003a
Guadeloupe	Allée Dumanoir	Early/Middle Ceramic	Early/Middle Cedrosan Saladoid	2	Etrich_2003b
Guadeloupe	Anse à la Barque	Undetermined	Undetermined	1	Turpin_2015
Guadeloupe	Anse Bertrand	Undetermined	Undetermined	2	Turpin_2015
Guadeloupe	Anse Ste Marguerite	Undetermined	Undetermined	4	Delpuech_2007
Guadeloupe	Cathédrale	Early/Middle Ceramic	Saladoid	6	Bonnissent&Romon_2004
Guadeloupe	Butel	Undetermined	Undetermined	1	
Guadeloupe	Grand Carbet	Early Ceramic	Early Cedrosan Saladoid	1	ToledoIMur_2003
Guadeloupe	Ilet Gosier	Late/Final Ceramic	Troumassoid	1	Romon-etal_2003
Guadeloupe	Les Mineurs	Undetermined	Undetermined	3	
Guadeloupe	Plage de Roseau	Contact	Cayo	2	LeLay_2013
Guadeloupe	Anse Vinaigri	Undetermined	Undetermined	3	
Guadeloupe	La Ramée	Early/Middle Ceramic	Saladoid	3	Casagrande_2013
Grenada	Pearls	Early/Middle Ceramic	Saladoid	1412	Murphy-etal_2000
Grenada	Grand Anse Beach	Early/Middle Ceramic	Saladoid	3	Cody_1993
Grenada	Caliviny Island	Early/Middle Ceramic	Undetermined	3	Bullen&Bullen_1968

Grand Turk	Governor's Beach (GT2)	Final Ceramic	Ostionoid meillacan	5	Carlson_1995
Hispaniola	El Flaco	Final Ceramic	Chican, Meillacan, Ostionan Ostionoid	91	Falci-etal_2020
Hispaniola	La Luperona	Final Ceramic	Meillacan Ostionoid	6	Falci-etal_2020
Hispaniola	El Carril	Final Ceramic	Meillacan Ostionoid	10	Falci-etal_2020
Hispaniola	El Cabo	Final Ceramic	Ostionan, Chican Ostionoid	37	Falci-etal_2020
Hispaniola	Playa Grande	Final Ceramic	Ostionan, Meillacan et Chican Ostionoid	17	Falci-etal_2020
Jamaica	C12 Logie Green	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	C7 Harmony Hall	Early/Middle Ceramic	Saladoid	3	Roobol&Lee_1976
Jamaica	C8 Wallman Town	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	E2 Fort Charles	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	E5 Alligator Pond	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	K13 Bellevue	Early/Middle Ceramic	Saladoid	6	Roobol&Lee_1976
Jamaica	Y19 Pepper	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	Runaway Bay	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	S12 Naggo Head	Early/Middle Ceramic	Saladoid	2	Roobol&Lee_1976
Jamaica	S8 Marlie Mount	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	T1 New Forest	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	Y19 Coleraine	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
Jamaica	Y21 Fort Haldane	Early/Middle Ceramic	Saladoid	1	Roobol&Lee_1976
La Désirade	Morne Cybèle 1	Final Ceramic	Suazan Troumassoid	1	Hofman_1995
La Désirade	Petite Rivière	Late/Final Ceramic	Troumassoid	4	deWaal_2006
Martinique	Anse Trabaud	Late/Final Ceramic	Troumassoid	2	Mattioni_1983
Martinique	Vivé	Early Ceramic	Early Cedrosan Saladoid	40	Mattioni_1979
Martinique	Moulin l'Etang	Early Ceramic	Early Cedrosan Saladoid	1	Bérard_2004
Martinique	Macabou	Final Ceramic	Suazan Troumassoid	1	Allaire_1977
Martinique	Diamant	(Middle?) Ceramic	Middle Cedrosan Saladoid	1	Vidal_1995
Martinique	Pory-Papy	(Middle?) Ceramic/final	Cedrosan Saladoid - Troumassoid	3	Argant_2017
Martinique	Perrinon-Doume	(Middle?) Ceramic/final	Cedrosan Saladoid - Troumassoid	1	Honoré_2017
Marie Galante	Cocoyer St Charles	Early Ceramic	Early Cedrosan Saladoid	1	Stouvenot_1999
Marie Galante	Grotte Cadet 2	Late/Final Ceramic	Troumassoid	1	Courtaud-etal_2005
Marie Galante	Stade J. Bade	Late Ceramic	Troumassoid	4	Serrand-etal_2016
Marie Galante	Taliseronde	Early/Middle Ceramic	Early/Middle Cedrosan Saladoid	1	Durand&Petitjean-Roget_1991
Montserrat	Trants	Early/Middle Ceramic	Saladoid	602	Crock&Bartone_1998
Nevis	Hichmans	Ceramic	Saladoid - Post-Saladoid	1	Wilson_1989
Puerto Rico	Hacienda Grande	Early Ceramic	Huecan Saladoid	16	Crock&Bartone_1998
Puerto Rico	Tecla	Early Ceramic	Huecan Saladoid	72	Narganes-Storde_1999
Puerto Rico	Punta Candelero	Early Ceramic	Huecan Saladoid	592	Rodriguez_1991

Puerto Rico	Punta Mameyes	Early/Late Ceramic	Cedrosan Saladoid - Ostionoid elenan	4	Ortiz-Montanez-etal_2019
Puerto Rico	Ponce 29 (PO-29)	Late Ceramic	Ostionoid	1	Espenshade_2014
Sainte Croix	Prosperity	Early/Middle Ceramic	Cedrosan Saladoid	26	Hardy_2009
Sainte Croix	Cane Bay	Late Ceramic	Ostionoid	2	Hardy_2008
Sainte Croix	Jolly Hill	Late Ceramic	Early Ostionoid	2	Hardy_2008
Sainte Croix	O30. Krause	Early Ceramic	Cedrosan Saladoid/huécan	9	Toftgaard_2019
Sainte Croix	O18. Spratt Hall	Early Ceramic	Cedrosan Saladoid/huécan	2	Toftgaard_2019
Sint Eustatius	Golden Rock	Early/Middle Ceramic	Saladoid	81	Versteeg_1999
Saint Lucia	Lavoutte	Final Ceramic	Suazan Troumassoid	1	Hofman_2012
Saint Martin	Baie Orientale 2	Late/Final Ceramic	Troumassoid marmoran (Mill Reef)	100	Bonnissent_2008
Saint Martin	Hope Estate	Early Ceramic	Cedrosan Saladoid/huecan	115	Bonnissent_2008
Saint Martin	Grand Case BK77	Late/Final Ceramic	Troumassoid marmoran (Marmora Bay)	12	Sellier-etal_2020
Saint Martin	Grand Case BK78	Late/Final Ceramic	Troumassoid	3	Baillif-Ducros-etal_2019
Saint Martin	Baie Orientale 1	Archaic		1	Bonnissent-etal_2013
Saint Thomas	Tutu	Early/Middle Ceramic	Saladoid	6	Righter_2003
Saint Thomas	Main Street	Early/Middle Ceramic	Saladoid	15	Carlson_2019
Saint Vincent	Arnos Vale	(Middle?) Ceramic	Middle Cedrosan Saladoid	1	Cody_1993
Saint Vincent	Escape	Ceramic (moyen?)	Saladoid (late?)	5	Moravetz&Callaghan_2011
Tobago	Lovers Retreat (TOB-69)	Late Ceramic	Troumassoid	4	Harris_1980
Tobago	Milford 1 (TOB-03)	Undetermined	Undetermined	1	Mones_2007
Tobago	Golden Grove (TOB-13)	Late Ceramic		271	Mones_2007
Tobago	Friendship (TOB-15)	Early/Middle Ceramic	Barrancoïde	7	Mones_2007
Trinidad	Atagual	Early/Middle Ceramic	Cedrosan Saladoid	1	Boomert_1987
Trinidad	St. Bernard	Undetermined	Undetermined	1	Boomert_1987
Trinidad	Erin Bay	Undetermined	Undetermined	1	Fewkes_1914
Vieques	Sorcé	Early Ceramic	Cedrosan Saladoid	1054	Narganes-Storde_1999
Vieques	Sorcé La Hueca	Early Ceramic	Saladoid huecan	2877	Narganes-Storde_1995

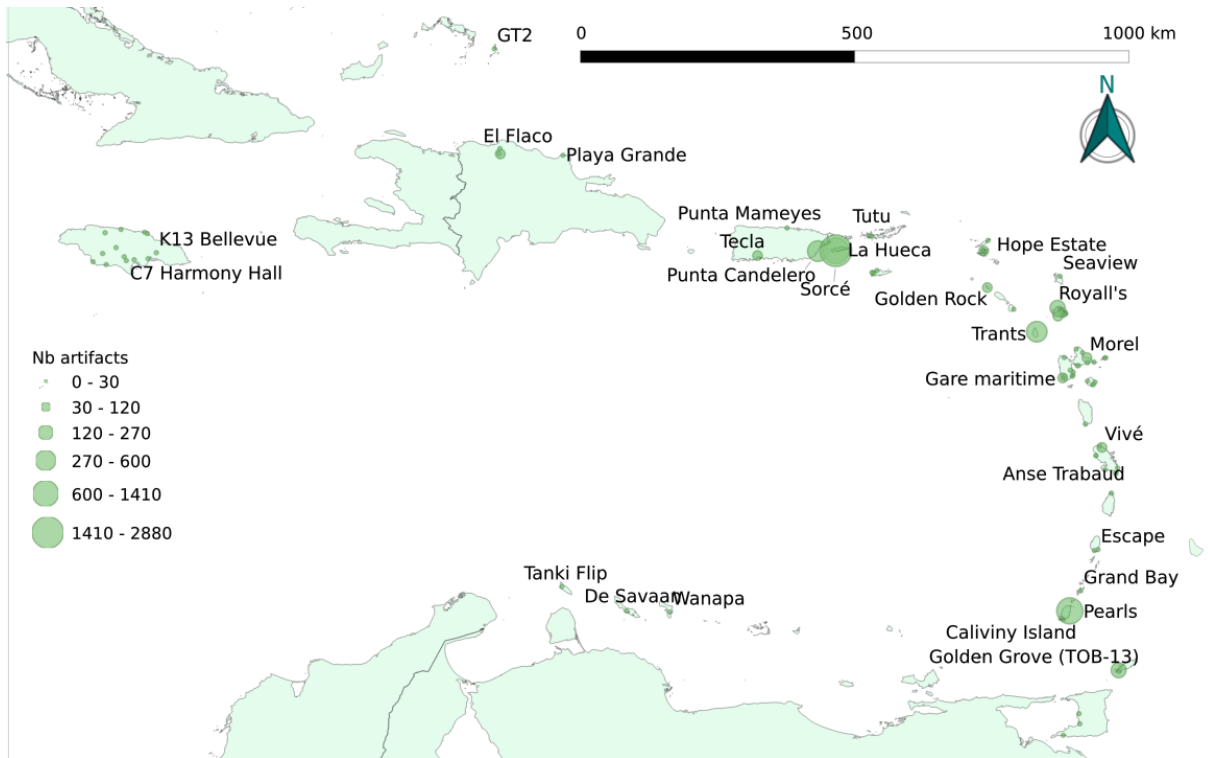


Figure 8. Location of the sites registered currently in the database, with the spot size relative to the number of artifacts inventoried.

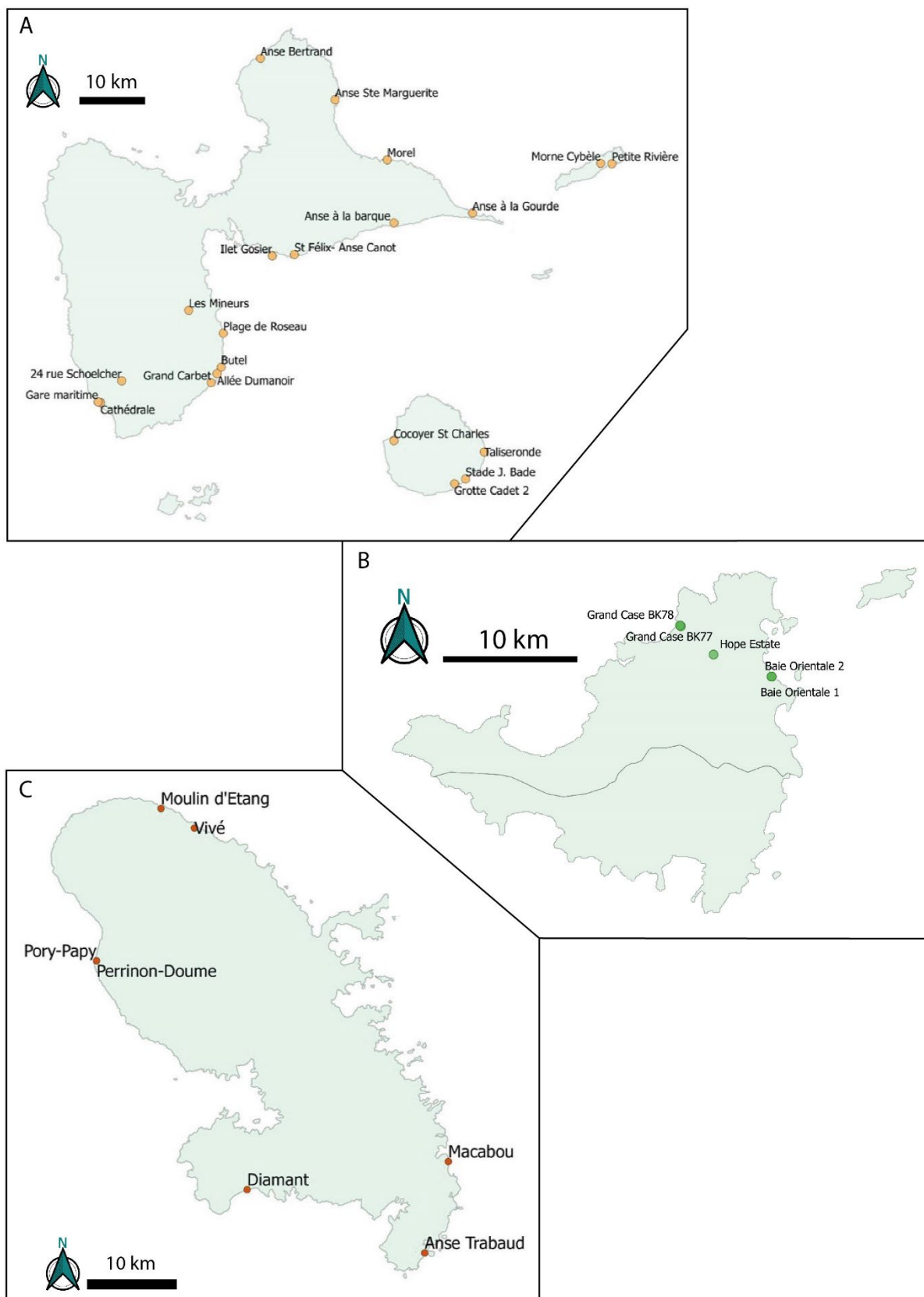


Figure 9. Distribution of the archaeological sites documented in the database for the archipelago of Guadeloupe (A), Saint-Martin (B) and Martinique (C)

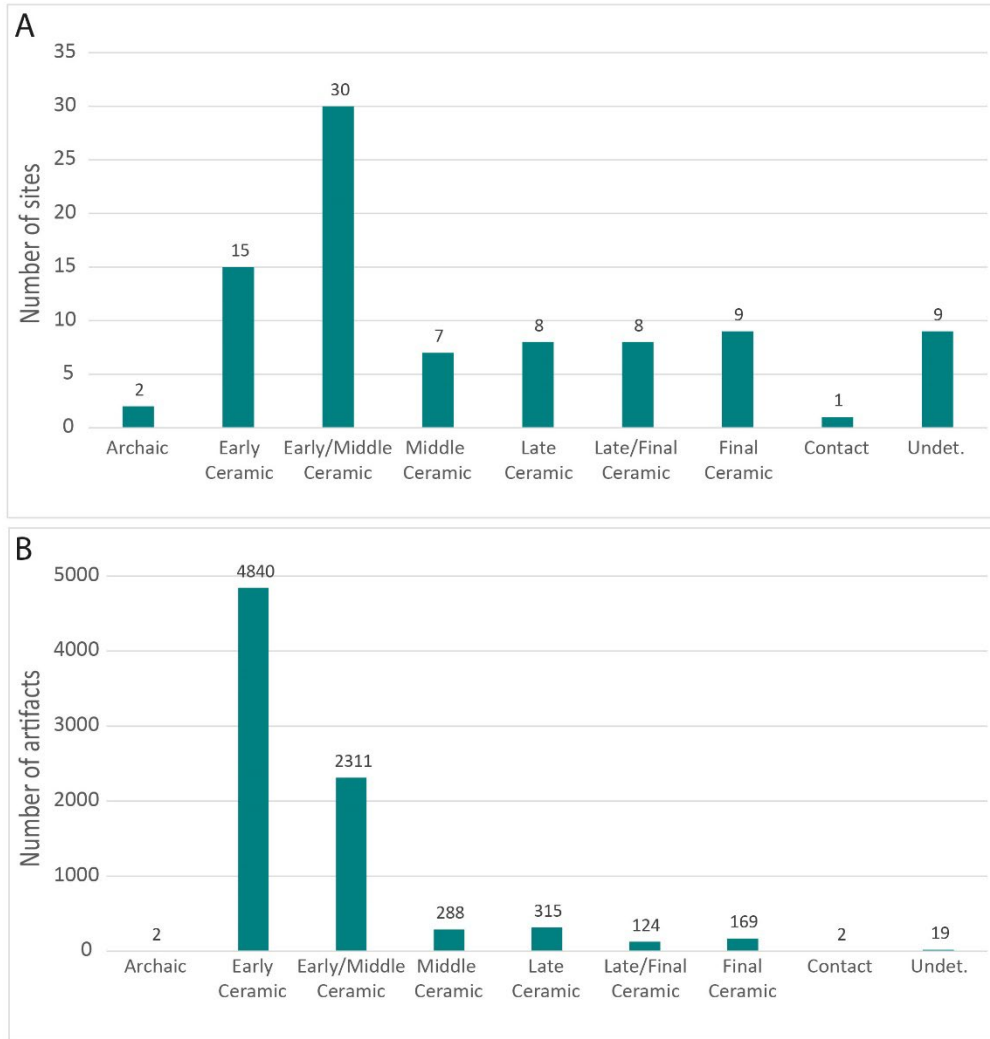


Figure 10. Distribution of the number of sites (A) and artifacts (B) in the regional database by archaeological period.

We also note that the distribution of objects per site is not at all homogeneous and that only a few sites form the majority of the corpus inventoried, when the vast majority of the sites have yielded less than 10 artifacts (Figure 11). Only 5 sites really stand out as having provided more than 500 objects each: Sorcé - La Hueca, Pearls, Sorcé, Trants and Punta Candelero, three of which are located in Puerto Rico/Vieques.

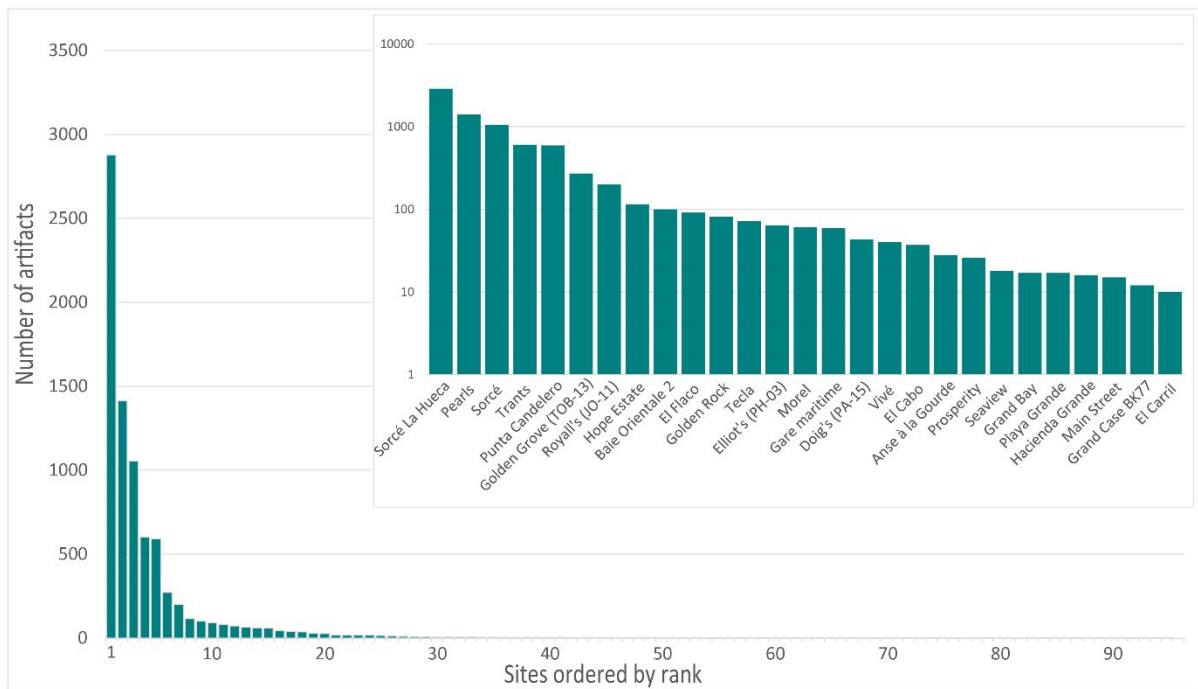


Figure 11. Distribution of the number of artifacts per site with an insert, in Log scale, of the sites having delivered at least 10 artifacts.

Beads dominate the inventory to a large extent (Figure 12), being twice as numerous as pendants, followed to a lesser extent by fragments of raw material (which correspond to any fragment of rock most probably intended for lapidary production but not yet having reached the preform stage). This relative scarcity of initial elements and waste from the chaîne opératoire, although it may be a real archaeological fact, could also be linked to the lack of recording/mentioning of these objects at the various stages of archaeological research, from excavation (absence of sieving) to publication (no mention of raw materials). Only five sites account for 88% of the objects classified as raw material, but it should be noted that the absence of a count of raw material shards in the very rich sites of Puerto Rico and Vieques, although indicated as being present “in large quantities” (Narganes Storde, 1995), obliterates a certainly not insignificant part of the archaeological record because they cannot be included in our database. The more rarely identified object types include unperforated plates, bead-pendants, which are mostly longitudinally and transversely perforated cylinders, a few unidentified objects (often because they are still preforms), and, finally, labrets, which are rather thin and long objects, but whose attribution as a labret remains speculative.

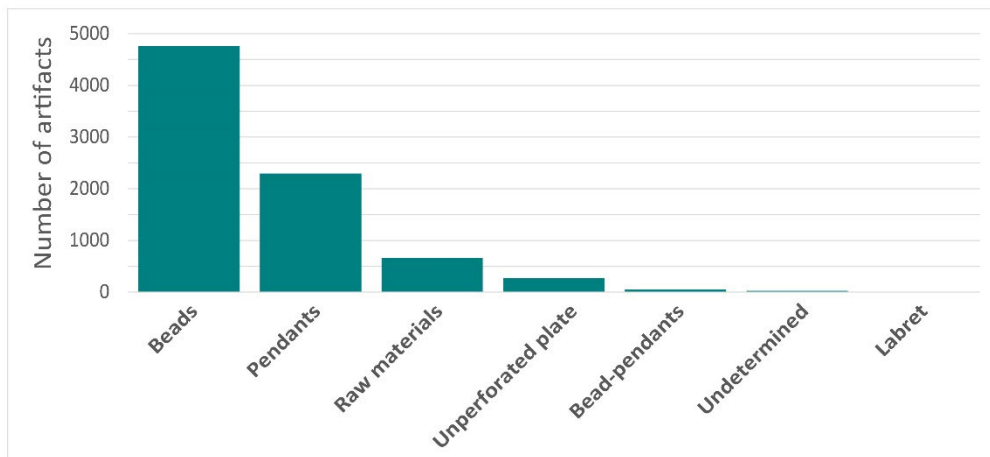


Figure 12. Distribution of the number of artifacts inventoried by major types.

Among the different types of beads, the most numerous are the discoid kind, followed by cylindrical ones (Figure 13). Plano-convex beads were found in similar numbers to barrel-shaped beads, the other types being much rarer. In view of the collections studied in detail on the French Caribbean islands, this third position of plano-convex beads is surprising. However, it should be noted that their number is mainly driven by a few sites such as Sorcé - La Hueca which accounts for 72% of their numbers, while barrel-shaped beads are more evenly distributed although the Pearls site accounts for 56% of the total.

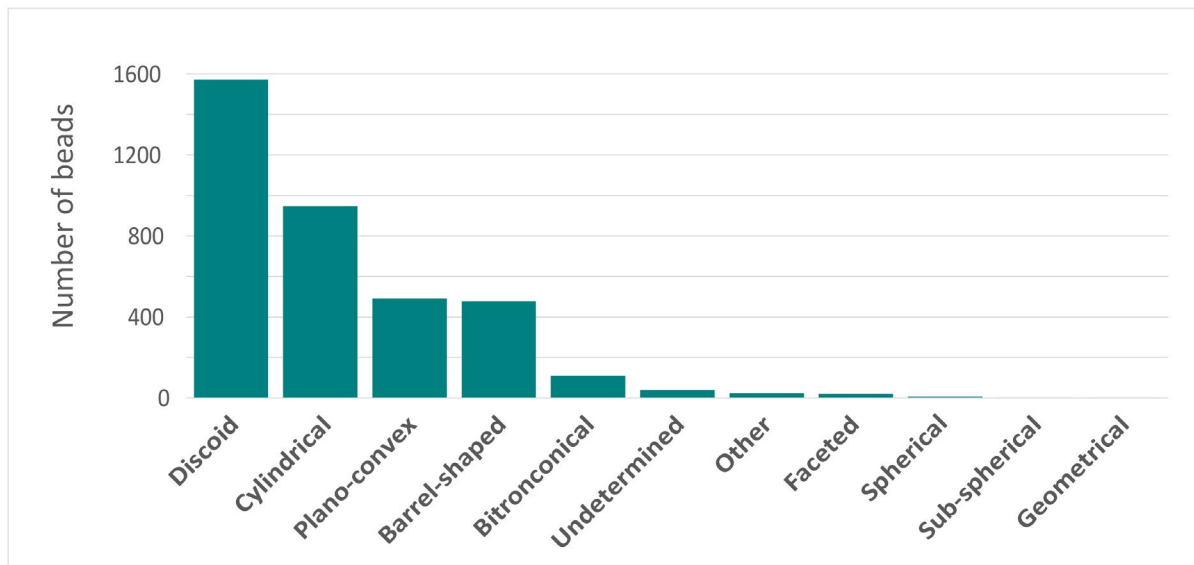


Figure 13. Distribution of the number of beads for each of the subtype.

The lapidary production of pendants in the Ceramic period is largely dominated by zoomorphic forms (91% of the corpus) among which frogs are widely prevalent (Figure 14). Geometric pendants of various shapes are the second most common type. Other forms are very rare and not very diverse.

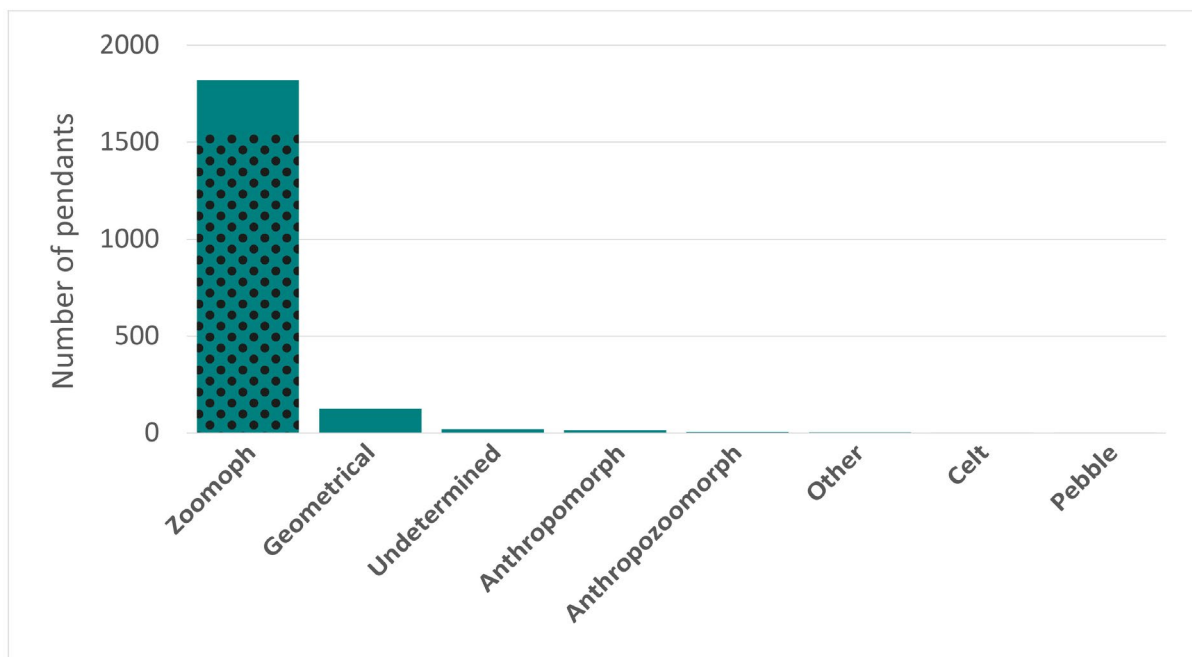


Figure 14. Distribution of the number of pendants for each subtype. The contribution of frogs to zoomorphic pendants is shown as a superimposed pattern (black dots).

It must also be noted that, although this database certainly lists a very large proportion of the archaeological sites of the Ceramic period that have yielded stone ornaments, there is still considerable room for improvement in the data it contains. Another current limitation to be highlighted is that the distribution of the raw materials used clearly indicates the predominance of the indeterminate in the database: they represent almost half of the corpus! This lack of knowledge further underlines the need for additional studies including precise raw material identification to increase the strength of our interpretations of diffusion networks in the future, especially in the richer sites that have not been subject to such work. When focusing on the different raw materials identified so far, the corpus is largely dominated by diorite and serpentine, followed quite far behind by rock crystal and then by a group formed by calcite, carnelian, jadeite, turquoise and amethyst (Figure 15). As this database is largely based on an inventory drawn from the literature, these proportions of material differ from those that can be established solely from the set of sites located in the French islands where the raw materials have been systematically analyzed (Queffelec et al., 2020a, 2020b, 2018). In particular, the work carried out on these sites did not identify a single jadeite bead or pendant, and it is very likely that several of the green materials that we were able to identify through Raman spectroscopy (paragonite, sudoite, clinocllore for example) could be found in the “jadeite category” of several authors who did not carry out these mineralogical analyses.

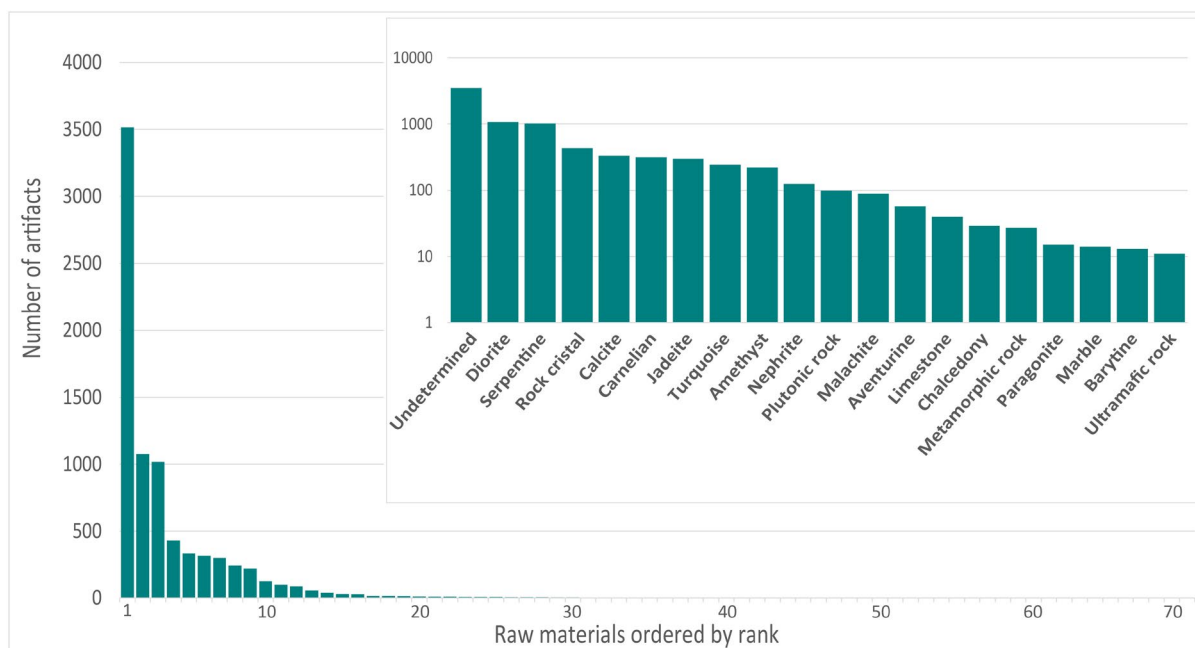


Figure 15. Distribution of the number of artifacts by raw material with an insert, in Log scale, of the raw materials used to produce at least 10 artifacts.

Discussion et conclusion

By combining the analytical characterization and comprehensive documentation of Ceramic period lapidary production in the French islands of the Antilles with an intensive review of the scientific literature on the subject for the other islands, the establishment of a database of lapidary production at the scale of the islands of the Antilles allows for the robust validation of ideas that have already been established for a long time by archaeologists of the Caribbean area. It is now possible to attest and quantify that the Early Ceramic and Early/Middle Ceramic periods provided far more lapidary artifacts than the more recent periods, as already observed by several authors (Bérard, 2013; Hofman et al., 2014, 2007; Knippenberg, 2007; Rodríguez Ramos et al., 2013). Beyond this first chronological approach, such an inventory also makes it possible to highlight other information in terms of typology and raw materials used: beads are twice as numerous as pendants, discoid beads largely dominate over cylindrical beads, pendants are more than 90% zoomorphic and 85% of them represent frogs. Finally, this work has also highlighted the very important work that remains to be done on these objects, both in terms of mineralogical characterization (almost half of the beads are not determined at this level) and detailed typological documentation. Further studies of these data are planned in order to compare more precisely the distribution of types, raw materials, and combinations of these two parameters, in time and space. For this, diversity analyses, ordering by means of seriations, comparisons thanks to correspondence analysis comparisons, and network analyses will be performed. Such documentation could also allow stylistic studies on pendants, by making a large number of photographs accessible to the greatest number of people, although on this point too, much work remains to be done.

Our proposal to use open online tools will hopefully encourage Caribbean archaeologists to participate in making the database even more exhaustive. It is indeed always possible to add new data and this database will be updated regularly, in particular during future studies of archaeological series from sites located outside the French islands of the archipelago.

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Bibliographie

- Bérard, B., 2013. The Saladoid, in: Keegan, W.F., Hofman, C.L., Rodríguez Ramos, R. (Eds.), *The Oxford Handbook of Caribbean Archaeology*. Oxford University Press, Oxford, pp. 184–197.
- Boomert, A., 1987. Gifts of the Amazons: Green stone pendants and beads as items of ceremonial exchange in Amazonia and the Caribbean. *Antropologica* 33–54.
- Cody, A.K., 1993. Distribution of exotic stone artifacts through the Lesser Antilles : their implications for prehistoric interaction and exchange, in: *Proceedings of the 14th Congress of the International Association for Caribbean Archaeology*. Barbados, pp. 204–226.
- Crock, J.G., Bartone, R.N., 1998. Archaeology of Trants, Montserrat. Part 4. Flaked stone and stone bead industries. *Annals of Carnegie Museum Pittsburgh* 67, 197–224.
- Curet, L.A., 2005. *Caribbean paleodemography: population, culture history, and sociopolitical processes in ancient Puerto Rico*. University of Alabama Press, Tuscaloosa.
- Falci, C.G., Knaf, A.C.S., van Gijn, A., Davies, G.R., Hofman, C.L., 2020a. Lapidary production in the eastern Caribbean: a typo-technological and microwear study of ornaments from the site of Pearls, Grenada. *Archaeol Anthropol Sci* 12, 53. <https://doi.org/10.1007/s12520-019-01001-4>
- Falci, C.G., Ngan-Tillard, D., Hofman, C.L., Van Gijn, A., 2020b. The biographies of bodily ornaments from indigenous settlements of the Dominican Republic (AD 800–1600). *Latin American Antiquity* 31, 180–201. <https://doi.org/10.1017/laq.2019.101>
- Harrington, M.R., 1924. A West Indian gem center. *Indian Notes* 1, 184–189.
- Hofman, C.L., 2013. The Post-Saladoid in the Lesser Antilles (AD 600/800-1492), in: Keegan, W.F., Hofman, C.L., Rodríguez Ramos, R. (Eds.), *The Oxford Handbook of Caribbean Archaeology*. Oxford University Press, Oxford, pp. 205–220.
- Hofman, C.L., Bright, A.J., Boomert, A., Knippenberg, S., 2007. Island Rhythms: The Web of Social Relationships and Interaction Networks in the Lesser Antillean Archipelago between 400 B.C. and A.D. 1492. *Latin American Antiquity* 18, 243. <https://doi.org/10.2307/25478180>
- Hofman, C.L., Mol, A.A.A., Rodríguez Ramos, R., Knippenberg, S., Bérard, B., Losier, C., 2014. Networks Set in Stone: Archaic-Ceramic interaction in the early pre-Colonial northeastern Caribbean, in: *Archéologie Caraïbe, Taboui*. Sidestone Press, Leiden, pp. 119–132.
- Keegan, W.F., Hofman, C.L., 2017. *The Caribbean before Columbus*. Oxford University Press.
- Knippenberg, S., 2007. *Stone artefact production and exchange among the Lesser Antilles*. Amsterdam University Press.
- Marwick, B., 2021. Open data on beads, pendants, blanks from the Ceramic Age Caribbean. *PCI Archaeology* 1, 100009. <https://doi.org/10.24072/pci.archaeo.100009>
- Murphy, A.R., Hozjan, D.J., de Mille, C.N., Levinson, A.A., 2000. Pre-Columbian gems and ornamental materials from Antigua, West Indies. *Gems and Gemology* 36, 234–245. <https://doi.org/10.5741/GEMS.36.3.234>
- Narganes Storde, Y.M., 1999. La lapidaria de Sorce, Vieques y Tecla, Guayanilla, Puerto Rico, in: *Proceedings of the 16th Congress of the International Association for Caribbean Archaeology*. Basse-Terre, pp. 17–26.
- Narganes Storde, Y.M., 1995. La lapidaria de la Hueca, Vieques, Puerto Rico, in: *Proceedings of the 15th Congress of the International Association for Caribbean Archaeology*. San Juan de Puerto Rico, pp. 141–151.
- Queffelec, A., Bellot-Gurlet, L., Foy, E., Lefrais, Y., Fritsch, E., 2021a. First identification of sudoite in the Caribbean Ceramic Age lapidary craftsmanship. *Gems and Gemology* 57, 206–226. <https://dx.doi.org/10.5741/GEMS.57.3.206>

- Queffelec, A., Fouéré, P., Bellot-Gurlet, L., Bérard, B., 2020a. Stone ornaments from Guadeloupe and Martinique Early Ceramic period sites (200 BC – AD 400), detailed analysis and comparison with a Late Ceramic period site (AD 750 – 1000). *Journal of Caribbean Archaeology* 20, 1–44.
- Queffelec, A., Fouéré, P., Bellot-Gurlet, L., Bérard, B., Rousseau, L., Villeneuve, J., 2020b. Parures amérindiennes en matériaux lithiques dans les Antilles Françaises : minéralogie, sources géologiques et fabrication (Rapport de Projet Collectif de Recherche). Service Régional de l'Archéologie, Basse-Terre, Guadeloupe.
- Queffelec, A., Fouéré, P., Caverne, J.-B., 2021b. A Database of Lapidary Artifacts in the Caribbean for the Ceramic Age. *Journal of Open Archaeology Data* 9, 11. <https://doi.org/10.5334/joad.74>
- Queffelec, A., Fouéré, P., Paris, C., Stouvenot, C., Bellot-Gurlet, L., 2018. Local production and long-distance procurement of beads and pendants with high mineralogical diversity in an early Saladoid settlement of Guadeloupe (French West Indies). *Journal of Archaeological Science: Reports* 21, 275–288. <https://doi.org/10.1016/j.jasrep.2018.07.011>
- Rodriguez, M., 1991. Arqueologia de Punta Candelero, Puerto Rico, in: *Proceedings of the 13th Congress of the International Association for Caribbean Archaeology*. Curaçao, pp. 605–627.
- Rodriguez, M., Rivera, P.D., 1991. Puerto Rico and the caribbean pre-saladoid “crosshatch connection,” in: *Proceedings of the 12th Congress of the International Association for Caribbean Archaeology*. Cayenne, pp. 45–52.
- Rodriguez Ramos, R., 2010. What is the Caribbean? An archaeological perspective. *Journal of Caribbean Archaeology* 3, 19–51.
- Rodríguez Ramos, R., Pagán-Jiménez, J., Hofman, C.L., 2013. The humanization of the insular Caribbean, in: Keegan, W.F., Hofman, C.L., Rodríguez Ramos, R. (Eds.), *The Oxford Handbook of Caribbean Archaeology*. Oxford University Press, Oxford, pp. 126–140.
- Roobol, M.J., Lee, J.W., 1976. Petrography and source of some Arawak artifacts from Jamaica, in: *Proceedings of the 6th International Congress for the study of Pre-Columbian cultures of the Lesser Antilles*. Guadeloupe, pp. 304–313.
- Watters, D.R., 1997. Maritime trade in the prehistoric eastern Caribbean, in: *The Indigenous People of the Caribbean*. University Press of Florida, Gainesville, pp. 88–99.

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