Revue bilingue de Préhistoire

Review published by the P@lethnologie association, created and supported by the TRACES laboratory, the Ethnologie Préhistorique laboratory, the University of Liège and the Ministry of Culture and Communication.

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This numeric publication received support from
OF SHELLS AND MEN:
the Economy of Coastal Populations on the Bay of Luanda (Angola) Throughout the Last Two Millenia

Nicolas VALDEYRON, Sonia Ludmila DA SILVA DOMINGOS

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http://www.palethnologie.org P@lethnology | 2012 | p. 111-140
OF SHELLS AND MEN:
the Economy of Coastal Populations on the Bay of Luanda (Angola) Throughout the Last Two Millenia

Nicolas VALDEYRON, Sonia Ludmila DA SILVA DOMINGOS

Abstract
In this paper, we present archaeological and ethnographic observations of several shell middens located near the Luanda lagoon in Angola, focusing on the evolution of the use of one mollusk, Arca senelis L., over the past two millennia. Known in the literature, the site of Cabolombo has been the subject of recent research (test pit 1) that supports the hypothesis that the site was first occupied by shellfish collectors, probably of the Bantu tradition. The sites of Kamabanga and Kitala suggest the existence of populations, between the 8th and 14th centuries, that were still collectors but who also took part in regional exchange networks. They may also have been specialized in the production of discs from shell test that could have been used as coins during the formative period of the Kingdom of Kongo. Test pits 4 and 14 at Cabolombo yielded indications of a colonial context (locally manufactured pipes) in an economic environment still oriented toward predatory activities. Test pit 9, on the other hand, revealed the use of mabangas as the raw material for lime production, probably under strict control by the Portuguese. Finally, though the major stages in the history of the peopling of the region can be reconstructed through archaeological research and though oral enquiries document the formation processes of the sites, the socio-economic and cultural status of the populations remains unclear.

Keywords
Angola, Bay of Luanda, shell middens, Late Stone Age, Iron Age, Bantu, Khoesan, Kingdom of Kongo, Arca senelis, ethnology.

1 - Conditions of this intervention and resulting limitations

From late 2004 to 2007, the Service de coopération et d’action culturelle of the French Embassy in Luanda (Angola) funded, for one of us (N.V.), three field sessions for a total duration of approximately one month. This work constituted part of the doctoral dissertation of S. Domingos, then working with a grant from the French government and enrolled at the University of Toulouse-Le Mirail to realize, after a Masters degree (Domingos, 2003), a doctoral thesis under the direction of M. Barbaza (Domingos, 2009). As one of the original aims of this research was to contribute to our knowledge of the process and pace of the acquisition of food production and craft techniques by the coastal populations of the capital region, it was necessary to verify and possibly revise the existing data. In addition to this essential objective, it was also a priority to strengthen the relationships between the two parties, requiring the signature of conventions with the University Agostinho Neto in Luanda and the Instituto Nacional do Património Cultural. Due to the time...
necessary for the negotiation and signature of the conventions, which did not occur until 2009, we were not able to develop a complete research program, which could have been funded by the French ministry of foreign and European affairs through the consulting committee of archaeological research abroad. The research thus conducted during these sessions had only limited funding that did not permit us to form the multidisciplinary team originally planned. Some data – in particular on the coastal paleoenvironment and its evolution, or on absolute dating elements – are thus missing or are insufficiently recorded. Therefore, some of the results presented, as well as some of the hypotheses formulated, will need to be verified through future work. Despite these absences and reservations, we believed it is useful to present at least part of our results, focusing on the recurrent use of *Arca senelis* throughout the last two millennia. Through time, this bivalve mollusk played a changing, but always unique, role in the economy of the populations of the region. These variations more or less reliably illustrate the socio-economic transformations of the associated human groups. We will demonstrate this by travelling through both time and space across the whole of the Luanda lagoon to present the main results of our excavations and oral investigations. The order of the succession of the sites corresponds to the chronology that we believe best fits the data.

2 - The Luanda lagoon: a clear window of observation

The zone concerned by our research, which is mainly coastal, is located approximately 10 km to the south-south-west of the Angola capital. It extends around a large lagoon (35 km long and 3 km wide where it meets the ocean, with a maximum width of 4 km) delimited by a continuous series of thin sandbars (maximum width less than 1 km) called “restingas”, which form the Mussulo peninsula. Between the continent and Mussulo, and at an equal distance from the two shores, a relatively large island (5 × 1.6 km) occupies the north-west part of the lagoon, reducing the marine flow between the open sea and the more southern zones, whose shoals are largely silted up, as is seen in aerial photographs (figure 1). The contact between the sea and land takes different forms on the eastern shore of the lagoon, depending on the sector. In the north, in the direction of Futungo, more or less abrupt cliffs reach 10 to 20 m high. These cliffs have been strongly degraded by run-off, which has sculpted the variably hard sand and sandstone layers into “badland”, or tower-like, reliefs (figure 2). Further to the south, toward Praca do artesanato and beyond, the same process occurred but with less intensity. The resulting coastal relief developed more gradually, forming small beaches in some locations. These are usually very small, sometimes even just a tidal zone, and thus visible only at low tide. In these sectors, we must search for potential sites at high points that have been spared from rises in sea level and gullying. Toward the end of the lagoon, and in its direct extension toward the south, we find the same processes as those observed in the north, but with a much greater intensity. Here the cliffs are several tens of meters high in some locations (figure 3). Along the 35 km length of the lagoon, the only really flat and relatively large zones that come into contact with the sea correspond to small coastal depressions. These are located at the outlets of thalwegs saturated with silts and with streams running through them. These streams are rarely perennial, but in humid periods can dig deep into and remove portions of the alluvial plain on which they are located. These zones are thus easily recognizable since there are usually no occupation sites on them, or at least no modern ones.

Though we do not know the date and exact conditions underlying the formation of this global configuration, it is probably the result of a gradual development during the Holocene. It constitutes a complex ecosystem that probably favored the development of abundant and varied resources. Almost all of the wild mammals and birds have disappeared due to the high human population...
density along the coast. The marine resources (fish, crabs, shellfish, crustaceans, etc.) are very rich, on the other hand, despite collection practices that are far from fitting the definition of “sustainable”. Among these food resources, one shellfish, *Arca senelis* (locally known as “mabanga”), plays a major role. Nonexistent in zones with a strong current, this bivalve is naturally found in shallow waters with a salinity level greater than 10‰ and in which diurnal and seasonal fluctuations are minimal. *Arca senelis* is particularly well adapted to coarse sand and black ooze zones.
(Gofas et al., 1985). It is common on all the Atlantic coasts of Africa (in Senegal it is called “pagne”), from Mauritania to Namibia. Considering the conditions described above, it is easy to understand why it is present in high quantities in the Luanda lagoon, probably throughout the past several millennia, even if the available data (see below) do not permit us to go back further than our current era (AD).

3 - Before the Europeans

3.1 - Cabolombo: test pit 1

Since it was first explored in the 1960s (Santos Junio, Ervedosa, 1970), the shell midden of Cabolombo in Benfica has been considered as the reference site for recent Prehistory in Angola. It is regularly cited in the literature on the penetration of southern Africa by cultures of the Bantu tradition who introduced the agricultural and ironworking economy (Ervedosa, 1980; Clist, Lanfranchi, 1991; Abranches, 1992; Mitchell, 2002; Sadr, Sampson, 2006; Huffman, 2007). The site, located around fifteen kilometers to the south of Luanda, opens onto the largest coastal depression of the lagoon, that of Rio Cabolombo. It currently consists of a low humid zone forming a sort of large quadrilateral (approximately 400 × 300 m) limited to the north and south by more or less pronounced reliefs. An oval, sub-horizontal platform – probably a fossilized dune – located around one hundred meters from the coastline, occupies the western part of this depression. It is around ten meters high and covers a surface of approximately 6 500 m² (130 × 50 m). Towards the north, it is separated from a small knoll that extends it to the Rio Cabolombo bank by a tide channel that interrupts the continuity between the two surfaces (figure 4). The 1960 excavation probably concerned this platform, though we were unable to find its location. This is probably due to the partial destruction of the platform by a developer in 2001 during the creation of a sand quarry; the zone explored by our predecessors appears to have disappeared at this time. Between 2006 and 2007, we made 14 test pits (figure 5) on the platform and the surrounding area (Valdeyron, Domingos, 2009).

Test pit 1 was made on the top of the platform 1, covering a surface of 4 m². It enabled us to observe a sequence of compact sand composing a simple and clear stratigraphy with no significant slope, around forty centimeters deep (figure 6). At the base (layer 8), we found a thin accumulation of Arca senelis shells associated with numerous fish remains (vertebra, brachial system bones, ribs) and fragments of crab shells. The layer also yielded a few wild mammal bones [including a lower first molar and a 4th metacarpal of a canid (perhaps a fox), as well as the sesamoid of an equid (perhaps a zebra)], a few thick-walled pot sherds (hand-made with no decoration) and a tiny fragment of iron. Rubefaction rings indicate the presence of probably flat hearths, and one hollowed-out structure around fifteen centimeters deep and filled with shells, which probably also functioned as a hearth (figure 7). The overlying sedimentary units (layers 7 to 1) did not contain shell accumulations and starting with layer 6, they yielded abundant tile and brick remains, indicating the beginning of the colonial period. These remains likely originate from the “fazenda de Bellas” factory located in the sector since at least the 18th century and specialized in the production of clay bricks, tiles and dishes, in addition to rope (Domingos, 2003).

1. Three radiocarbon dates indicate a significant chronological duration for the formation of the shell midden [Pta 212: 1810 ± 50 BP; Pta?: 1770 ± 55 BP and Pta?: 600 ± 65 BP (we do not know the laboratory codes of the last two dates)], even if the authors of the excavation attribute most of the artifacts to a single phase, the Early Iron Age.
Figure 4 - Cabolombo, in Benfica, satellite view (source: Google Earth; altitude 695 m). To the north, the Rio Cabolombo and the steep slopes lining the two banks. In the center, the fossil dune divided into two parts (PFP: main platform; PFS: secondary platform) by a tide channel. The dotted lines and white background show the foundations of demolished buildings of the “fazenda de Bellas” uncovered by A. Vasco Rodrigues in the 1960s.

Figure 5 - Cabolombo, in Benfica, satellite view (source: Google Earth; altitude 712 m). Location of the test-pits realized on the left bank of the Rio Cabolombo in 2006 and 2007 (the letter “F” corresponds to test pit 9, associated with the lime kiln).
Figure 6 - Cabolombo, view of test-pit 1 in the process of excavation. Part of the midden – here more a bed than a midden – of *Arca senilis* shells appears in the square located in the top of the photo (photograph and excavation: N.Valdeyron).

Figure 7 - Cabolombo, close-up of test pit 1: probable combustion feature, filled with shells, bones and a few pot sherds, after it was emptied. The date of the layer 8 was obtained from a charcoal fragments collected in the bottom of this feature (photograph and excavation: N.Valdeyron).
The first occupation of the site would thus have been by an exclusively predatory population living in an open-air habitation whose nature and exact size remain to be determined. The presence, even slight, of thick, hand-built pottery (with no clear form or decoration), a metal fragment within a reliable stratigraphic position, and the absence of pieces suggesting contacts with the Portuguese, indicate that this first occupation can be attributed to a pre-colonial phase, but post-LSA. The AMS date of layer 8 – 1715 ± 30 BP [or 246 to 401 AD; Lyon-4028 (OxA)] – realized on a charcoal fragment recovered at the bottom of the small combustion feature, concords perfectly with this estimation. It is moreover very similar to the two dates obtained by C. Ervedosa (1980), leading us to think that we found part of the midden that he explored. The data collected in test pit 1, in accordance with those that he published (Ervedosa, 1980), provide evidence for a high dietary specialization on the part of these coastal populations that seem to have turned their backs on a production economy in favor of a broad scale predatory economy, associating collecting, fishing and hunting in a manner that probably implied a high degree of residential mobility. For populations that appear to have belonged to the Bantu tradition (which would confirm C. Ervedosa’s attribution of decorated pottery to the Early Iron Age, despite clear mixtures with more recent artifacts), these data might contradict classic scenarios that claim the primacy of itinerant agriculture in their subsistence economy. Similar situations have nonetheless already been described in comparable chronological contexts, such as at the site of Oveng in Gabon (Van Neer and Clist, 1991), which shows that during their expansion, Bantu populations integrated variable techno-economic models, often depending on the nature of the environments in which they lived. Another interpretation could be that the situation identified at Benfica could be the result of an acculturation by Bantu tradition groups of indigenous coastal populations, to whom the newcomers would have transmitted the use and manufacturing of pottery and, to a lesser extent, metal. The acceptance of such a scenario, which is possible in theory, is nonetheless hindered by a general lack of knowledge of contexts predating the Iron Age across all of this part of Angola, contexts for which the data has barely advanced over the last twenty years (Clist, 1992).

3.2 - Kitala and Kamabanga

Discovered in the 1970s, the Kitala and Kamabanga shell middens (Kwa-mabanga means “that of the shells” in the Kimbundu language) are located in the southern part of the Bay of Luanda, around fifteen kilometers south of Cabolombo. They extend on either side of the road that runs along the coast, at the top of a hill (65 m altitude). Their proximity to the sea (less than 500 m) is not very significant because in this sector the point of contact with the intertidal zone consists of a more or less vertical precipice several tens of meters high. It is easiest to reach the site from the coast by following a small valley that opens below and to the south of the site. This route considerably increases the distance to be travelled, but facilitates movements between the two zones. This unique topographic setting, which appears to have been intentionally chosen, clearly prohibits a direct access between the beach and the shell midden. This situation seems paradoxical given that this is the largest known shell midden known in Angola, in terms of both its thickness (in some locations nearly 1 m deep) and its surface area (the archaeological site covers several hectares and in fact encompasses several sites, including Kitala and Kamabanga). It is certain that the choice of this location was influenced by factors other than that its proximity to the beach, and we can imagine that the dominant position responds to two needs: to control this part of the lagoon and to protect the site (figure 8).

The site of Kamabanga, the closest to the shore, was partially excavated in 1982 by H. Abranches. He made several test pits, but information is available only for that of Kamabanga I-A (Abranches, 1982). This latter covers a surface of 9 m² and contains an apparently thin deposit of Arca senilis.
Several hundreds of potsherds were found in the different layers. Among these, Abranches distinguished a particular type with thin walls, a red slip and temper containing mica. This assemblage was accompanied by two very particular vases (no precise details were given): one anthropomorphic vessel and one “cosmetic vase”. Both were made with a fine clay and were probably imported: the anthropomorphic vase would have come from Cabinda, north of Angola, approximately 500 km from Luanda. H. Abranches (1992) asserts that these data could indicate the existence of three levels of specialization in pottery manufacturing: a domestic production, an artisanal production, and a more specialized production implicated in the diffusion of luxury objects. Terrestrial mammal bones, including zebra, warthog and domestic ox, were found in large quantities (Clist, Lanfranchi, 1992). A fishnet weight accompanied numerous fish remains. These different elements suggest a complex economy oriented toward both sea and land resources, based on both predation and production, and taking part in a long distance exchange network. No metal objects were mentioned, which is odd given the date obtained from this test pit (Clist, Lanfranchi, 1992), which situates it between the end of the 8th and the first half of the 12th century AD (Gif 6182: 1120 ± 60 BP, or 782-1140 AD after calibration with a two-sigma interval). We attempted to find the location of the site in 2007. Though we are not certain that we succeeded, in one field lying fallow that could correspond to the site, we collected a rather large quantity of pottery from the surface. This included several sherds that belonged to the same recipient, and made of a clay containing mica (with a lip and neck curved toward the outside, and with decoration realized by impression with the edge of a shell). The technical characteristics of these pieces (reddish slip on both faces)

Figure 8 - Kamabanga, view of the lagoon from the probable location of the sector tested by H. Abranches in 1982. The beach, several hundreds of meters away, is reached through abrupt slopes that are difficult to access. The site, which extends onto one of the high points of the edge of the lagoon, occupies a location that is both relatively well protected and has an unobstructed view of the surroundings (photograph: N. Valdeyron).
are identical to those described by H. Abranches for some pottery from Kamabanga I-A. This type of decoration and treatment (figure 9), which is unknown at Kitala, as well as at the other sites identified on the Bay of Luanda, could thus be a chronological indicator.

Figure 9 - Kamabanga, pot sherd with a thin-wall, clay with mica, red slip, decoration shell impressions (probably *Arca senilis*) and incisions. Found on the surface (survey: S. Domingos and N. Valdeyron; photograph: N. Valdeyron).

The site of Kitala, discovered in the 1970s during the construction of the coastal road (figure 10), was first explored across a small surface by C. Ervedosa and J. R. Santos Junior. The dismantling of the midden, composed almost exclusively of *mabanga* shells (along with a few oyster shells), also revealed the presence of terrestrial mammal (no other details provided) and fish bones, as well as

Figure 10 - Kitala, view of the profile on the edge of the coastal road. We see accumulations of shells (photograph: N. Valdeyron).
charcoal, pottery and shell beads, probably *Arca senelis*, some of which were perforated and calibrated (Ervedosa, 1980). The pottery is of the Bantu tradition, with a varied typology and decoration: incised or stamped pottery with motifs in relief, in the form of crescents, zigzags or chevrons (figure 11). In 1982, H. Abranches and his team from the National Museum of Anthropology conducted excavations in several sectors of the site, extending the test pit of C. Ervedosa (Abranches, 1982). They explored a total of 83 m² and found the same types of remains as those identified by their predecessor. In this case, the faunal data (Van Neer, 1990) indicates the simultaneous presence of zebra and domestic ox. In the same sector, and in association with a probable polisher in arenite, they also found several dozens of non-perforated, shell disks, with a diameter varying from 3 to 20 mm. H. Abranches interpreted these pieces as archaic coins, observing that the form of some of these beads was “irresistibly” similar to *zimbos* (or *nzimbos*), a shell (*Olivancillaria nana*) collected in the Luanda sector that was used as coins in the Kingdom of Kongo. A radiocarbon date (Gif 6011: 720 ± 60 BP, or 1229-1400 AD after calibration with a two-sigma interval) obtained from a “caramel” recovered from the bottom of a recipient found in test-pit IIb (de Maret, 1985), dates the occupation of the site to between the early 13th century and the end of the 14th century.

After reading the excavation reports by C. Ervedosa and H. Abranches, it seems possible to associate the shell middens at Kitala and Kamabanga with permanent occupation sites. The abundance of artifacts (especially pottery and bones), the fireplaces observed by two excavators, the shell disks – which could be the coins used by the Kingdom of Kongo and could thus indicate the presence, at the site, of the delegates of *Mani* (title of the sovereign) Kongo installed at Luanda – along with the anthropomorphic vase that perhaps originated from the Cabinda region – and which thus indicates the same geographic zone – are all elements that suggest an occupation pattern different from that of Cabolombo. In addition, the chronological interval obtained through radiocarbon dating (13th to 15th century) of the Kitala IIb test-pit corresponds to the formation period of the Kingdom of Kongo, thus supporting the interpretation of the shell disks as coins. In this chronological and economic context, the absence of iron objects and objects linked to agricultural practices (adzes, grinding stones, etc.) is surprising. It is thus possible that Kitala and Kamabanga were sites specialized in the collection and transformation of these shells that served as coins in the Kingdom of Kongo. As H. Abranches imagined, the agricultural activities would thus have

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**Figure 11** - Kitala, pot sherds (edge fragments). One of the fragments is decorated with “fishbone” incisions, the other with two imprinted zigzag lines associated with a horizontal groove that delimits the decoration under the lip (photograph and survey: S. Domnigos).
been practiced at other sites. It is thus likely that the relationship of these populations to shellfish cultivation resource evolved. While the flesh of these mollusks was probably consumed, it is possible that the shell had acquired a different status and entered, in the form of small disks considered as coins, into the trade networks of highly valued goods.

4 - The time of the colonies

4.1 - Cabolombo: test pit 4

Our chronological journey brings us now to Benfica, located on the easternmost part of the platform, on the left bank of Rio Cabolombo, approximately 200 m to the north-north-east of test-pit 1. Test pit 4 was interrupted when it covered only 1 m² and was explored to only around 40 centimeters in depth. The data obtained must thus be considered with caution (figure 12). While no structured layer was found, the upper part of the fill, layer 3, which was only slightly uncovered, yielded a relatively large quantity of archaeological artifacts. These objects were lying flat at a nearly identical altitude (-35 cm), suggesting the existence of an accumulation level, perhaps a true archaeological floor in the strict sense of the term. The pottery, mixed with a few scattered *Arca senelis* shells, is characterized by fine, hand-built walls, a well-controlled firing and a fine, shiny temper. Some sherds have a stamped decoration that could have been realized with a roulette or thin cord. In addition, two fragments (that refit to each other) of a clay pipe bowl were found in this level. Being of an indigenous tradition, they indicate that layer 3 – and therefore

![Figure 12 - Cabolombo, view of test-pit 4 in the process of excavation. The top of layer 3, visible in the lowest quarter, yielded relatively abundant archaeological remains. The date was obtained from charcoal fragments collected in the layer (photograph and excavation: N. Valdeyron).](image-url)
the decorated pottery that it contained – occupies a very interesting chronological position, forcibly later than the arrival of the first Europeans (figure 13). The AMS date obtained from a few charcoal pieces collected in the archaeological layer fully confirm this position: 375 ± 25 BP [Lyon-4029 (OxA)], or after calibration an interval of 1465 to 1631 AD, corresponding to the first centuries of the colonial presence (first Dutch, then Portuguese) in the Luanda region (founded in 1575 by the Portuguese).

The results obtained from this test pit remain to be confirmed since the very small surface area of layer 3 that was excavated excludes any definite conclusions. We can nonetheless retain a few important elements for our understanding of the local pottery sequence. The decoration realized with a roulette (or small cord) and organized in a rectangles or squares may be a chronological marker and thus complete the pattern (though still very loose) of the stylistic evolution of indigenous productions between the beginning of our era and the first colonization episodes. On the other hand, the data collected from test pit 4 do not clarify the role, during this period, of shells in the economy of the populations. Neither the economic status (hunter-gatherers? food-producers?), nor the social status (what were their relationships with the colonists, who rapidly turned the Luanda region into a central hub for the commerce of slaves?) of these populations can be addressed, moreover.

4.2 - Cabolombo: test pit 14

Test pit 14 is located fifteen meters to the north of test pit 4, on the edge of the Rio Cabolombo. It allowed us to uncover, over approximately 2 m² and under around twenty centimeters of superficial sediments (layers 1 and 2), the top of an Arca senelis midden (layer 3), perfectly in situ and covered with archaeological artifacts (figure 14): numerous quartz cores and flakes, diverse faunal remains (fish and crab, as well as terrestrial mammals, probably zebra) and fragments of several clay pipes, associated with a probable fireplace in a small depression. The absence of pottery, even if the exploited surface is small, is remarkable, as is the presence of an abundant lithic industry, until now never encountered in our test pits. We did not have the time to realize several vertical excavation units; therefore only the upper part was explored. The profile visible on the bank shows that we are on the edge of a lenticular accumulation several meters long and a maximum of at least thirty centimeters deep (figure 15). Even if no direct association could be made, the stratigraphic position of the deposit suggests a chronological position intermediary between the archeological layer identified in test pit 4 and that of test pit 9 (see below). We are probably within a range between the 16th and mid-19th centuries.
Figure 14 - Cabolombo, view of test pit 14 in the process of excavation. The top of the midden appears in only half of the test pit; the front part of the photo, which has no shells but where a glass bottle fragment was found, corresponds to a recently disturbed zone (photograph and excavation: N. Valdeyron).

Figure 15 - Cabolombo, midden discovered in test pit 14 observed on the section offered by the right bank of the Rio Cabolombo. The midden is situated under a grayish layer of overflowing silts with a high organic material content. This sedimentary unit extends across several hundreds of meters and constitutes an excellent stratigraphic reference point in this sector (photographs and excavation: N. Valdeyron).
Despite the limited nature of our work, this is an essential discovery that indicates the presence of indigenous populations (based on locally manufactured pipes) that were forcibly in contact with the Portuguese, but who maintained a traditional way of life based at least partly on a predation economy and on a technical toolkit that included the use of stone. It is of course too early to propose any hypotheses concerning the origin of these groups, their association with any particular cultural trend, or even their exact chronological position. We can nonetheless remark that their lithic industry (absent in the other test pits), composed exclusively of small white quartz flakes often made by bipolar percussion on small pebbles (figure 16), is very similar to the “unformal” industry of the Late Wilton in South Africa. This latter is present during the same period and in archaeological contexts that may be similar (i.e. shell middens) in association with Khoesan populations, whether pastoralists (among which these productions are dominant) or hunter-gatherers (Deacon, 1984; Mitchell, 2002; Rivat, 2006; Smith, 2006). This similarity is perhaps in large part representative of technological convergences linked to the use of an identical raw material, which limits possible variations. It is nonetheless troubling since this is not the only factor that suggests (much) more southern contexts. For instance, a pot sherd collected on the surface near the platform is very similar to fragments of recipients found by C. Ervedosa more than 800 km to the south of Benfica, at the site of Macahama, which appears to have been occupied by Khoesan-like populations. This small painted rock shelter in the Namib desert yielded, in association with a quartz flake industry, pottery with small volumes and apparently simple forms decorated with impressions usually located on the edge of the lip (Ervedosa, 1980). At least two recipients are decorated with undulating grooves (Ervedosa, 1980, p. 181, plate XXXV, A and B) identical to that observed at Cabolombo. One of the recipients at Macahama even has a horizontal decoration, like our specimen, of brush impressions made with a comb or roulette, at the base of the grooves (figure 17). These latter are less regular, and perhaps less undulating, than on our sherd, but the pattern is unique since no other sherd found at Cabolombo has this type of association. Moreover, the morphology of the lip, which is also unique, is identical on the three sherds. It consists of a flat, thick lip with a termination nearly perpendicular to the neck. More than a vague resemblance, this is almost certainly the same decorative theme, using the same techniques on the upper part of recipients with similar forms, making it difficult to imagine a simple convergence. The site of Macahama has not been dated and the associated ornaments are very evocative: out of 14 beads, only two were manufactured locally (one ostrich egg shell bead and one snail shell bead), and the 12 others were imported European glass beads. C. Ervedosa (1980) believes that the paintings, which represent various large mammals (elephant, zebra, lion, perhaps giraffe, etc.) and a few anthropomorphs, are contemporary with the archaeological artifacts and attributes the ensemble – industries and paintings – to the direct ancestors of the Cússis (or Kuísí), a Namib desert hunter-gatherer population characterized by the use of a “click” language of the Khoesan family.
Though, based on only a few quartz flakes and one pot sherd, it is obviously not possible to reliably associate two sites and conclude that they were occupied by populations of the same cultural tradition, and though it is also impossible to directly associate these populations with modern groups, all of these similarities indicate a research direction that should be further developed, especially since the Cuíssis themselves claim a more or less mythic origin in the Luanda region (Domingos, 2009). Whatever the geographic and exact ethnic origin of the populations responsible for the midden found in test pit 14, the dietary economy attested by this midden is based exclusively on predation, and the use of shells appears to be limited only to this dietary dimension. Except for the pipes, which were locally manufactured (figure 18) and clearly indicate a low chronological position, nothing distinguishes, in socio-economic terms, the archaeological indicators recovered from the midden in test pit 14 from those left more than one thousand years before by the groups responsible for the midden in test pit 1; as if nothing occurred in the meantime, not even the arrival of European colonists.
4.3 - Cabolombo: le test pit 9 (or “f”)

Test pit 9 was made to the north of the platform in a depression where numerous archaeological remains were observed in the slope, including tiles and wheel-turned pottery associated with a large quantity of often burned shells. The sedimentary features suggested a rapid deposition linked either to collapses or discard (figure 19). The creation of a profile perpendicular to a partially exposed wall allowed us to observe, along more than 5 m and 1.5 m in depth, the remains of an ancient lime kiln in which mabanga shells were used as the raw material (figure 20).

![Figure 19](image1.png)  
**Figure 19** - Cabolombo, view of the eastern slope of the main platform, in the sector with the lime kiln. Tiles, wheel-turned pot sherds and often burned mabanga shells are scattered over the ground, accompanied by bricks sometimes joined together with mortar (photograph: N. Valdeyron).

![Figure 20](image2.png)  
**Figure 20** - Cabolombo, view of the lime kiln in the process of excavation. In the eastern corner (right side of the photo), the fill lies up against a brick and stone wall, constructed with mortar. A detailed observation of the stratigraphy enables the identification of at least two phases of operation of the kiln, each represented by more or less thick layers of intensively burned shells. In the upper part of the sequence, a nearly continuous bed of tiles probably corresponds to the roof (photograph and excavation: N. Valdeyron).

This feature once again indicates the status and function of the site of Cabolombo after the beginning of the Portuguese colonization and the establishment of the “fazenda de Bellas” factory. The site, known to have produced bricks and tiles, would thus also have furnished lime.  

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2. Diderot speaks explicitly of this practice in his *Encyclopédia*, in the section devoted to the city of Luanda (at the time, Saint-Paul-of-Loanda).
This would be a minor detail if it did not demonstrate that the collection and use of shells at the site did not cease with the arrival of the Portuguese. While the presence of shells appears to have been exclusively associated with the dietary activities of the indigenous populations, a large part of them, and maybe the majority of those visible on the surface or on the edges of the mound, in fact served as the raw material for the fabrication of lime (figure 21), which has no connections with a “Mesolithic” lifestyle. Lacking radiocarbon dates, the date of the kiln is deduced from a clay pipe half-bowl discovered in the sediments. The fabrication of this object is mediocre (significant transverse and longitudinal asymmetry) and its decoration simple, realized by impression before firing (figure 22). According to D. Duco, expert at the Pijpenkabinet Foundation of the National Pipe Museum of Amsterdam, to which we showed photos, this pipe has a local origin and was probably made sometime between 1750 and 1850.

Figure 21 - Cabolombo, close-up of one of the burned shell layers in the lime kiln (photograph and excavation: N. Valdeyron).

Figure 22 - Cabolombo, half-bowl of an indigenous clay pipe with grooved decorations, found in the backfill of the kiln (photograph and excavation: N. Valdeyron).
With the chronology established, it remains to be determined how and by whom the shells were collected. We suggest two scenarios, the first of which could have two versions. If we first accept that the shells are strictly contemporary with the functioning of the kiln, they could have been collected either with the goal of producing lime, directly by or for the Portuguese, or for dietary purposes by the locals; the shells resulting from this latter collection then being integrated in the cycle of brick production. This second version seems even more likely given that the populations of the Luanda sector were specialized in the collection of zimbo, a shell that was used as coins until around 1850. It is feasible that these two collections (mabangas and zimbos) went hand in hand. This version, among other advantages, would explain the presence of fish and crab remains in the accumulations of shells found in the kiln, along with a few fragments of mammal bones. We see only one explanation for the presence of these latter remains: they resulted from the dismantling of anthropogenic accumulations at which the domestic activities of preparing and consuming these animals were carried out. It is difficult, for the moment, to favor one of these versions over the other (even if the second one would explain the presence of culinary remains other than the shells) since we know almost nothing of the relations between the colonists and the locals, especially since these relations could have changed through time as the Portuguese hold over the Luanda region was strengthened. It is possible that in the beginning, the factory simply benefited from the opportunity to exploit the remains of shells collected by local groups. It is also possible that in the face of an increasing demand for the raw material, the traditional collection rapidly became insufficient, making it necessary to increase the gain, possibly by force.

In the second scenario, which does not exclude the first, the collection of shells and the use of the kiln would have occurred at different times. It is entirely possible that the shells from the ancient middens were used for the production of lime. The progressive dismantling of these middens would thus resemble the exploitation of a quarry. This scenario, like the second version described above, would explain the presence of faunal remains in the kiln.

It will be necessary to consult the historical texts, especially the accounts of the first colonists, to find information on this aspect and to see whether indigenous populations lived on the coast during the period during which the factory was in use and if they practiced large scale collections of food resources. According to J. Rudner (1976) citing J. Vansina (1970), it appears that this was the case in the beginning of the contact period, but we still have no indication for the more recent periods, unless of course, the midden of test pit 14 occupies this chronological position. In this case, it could attest to the coexistence near the factory of human groups with very different socio-economic statuses (at least the indigenous populations with statuses that are difficult to define, and perhaps not homogeneous, and the Portuguese colonists), all of whom benefited from the exploitation of mabangas.

5 - Modern data: between tradition and modernity

In parallel with these excavations, several surveys were organized in the southern part of the Bay of Luanda in order to discover new shell middens and to identify the location of sites already known. They resulted in the discovery of a large number of middens, most of which are relatively recent and often provide more ethnographic than archaeological information. These middens illustrate the permanence of the practice of collecting mabangas in the Bay of Luanda and provide an opportunity to extend our diachronic inquiry to the present.

3. The Portuguese kingdom profited from the collection of zimbos by using them to buy slaves.
4. “We know from early Portuguese writing that the Luanda peninsula was inhabited by a tribe of Bantu fishermen and shellfish-eaters” (Rudner, 1976: 102).
5.1 - Mussulo

When we learned of the existence of middens or scatters of shells in the process of being formed in the southernmost part of the Mussulo peninsula, we went there in 2005 to verify this information. In effect, clearly recent middens extend almost continuously at the bottom of a small sandy cove, some in immediate contact with the shore and others more inland (figure 23). Their location is explained by the massive presence, in this part of the bay, of *Arca senilis* L. shells, which are easy to collect by hand at low tide or to bring to the surface using diverse instruments when they are deeper below the water. The transport of shells to the shore is easy and these accumulations, in immediate proximity to the procurement source, indicate a rapid transformation in place of the products collected at the time when they were needed, in the context of a collection that appears to correspond more to domestic needs than to commercial ones.

The first midden observed is also the most informative one in terms of function. It is located right on the edge of the water, the first shells even being touched and moved by the surf. It is oblong in shape and spreads over at least 200 to 300 m², though the vegetation that encroaches on its margins does not facilitate an accurate estimation of the surface area (figure 24). To the extent that we can judge, the average thickness of the midden is 30 to 40 cm: at least this is what is regularly measured on its edges, but it is probably much thicker in the center since it is slightly convex. In a few cases, the accumulation is locally much thicker, attaining nearly 1 meter. These situations most often seem to correlate with the presence of combustion features, around which the shells appear to have been discarded after cooking their contents. These features (figures 25, 26) are always rudimentary. They are generally circular with a diameter of 50 to 60 cm. They lie flat, directly on top of the midden, with no preliminary digging. A few stones or bricks sometimes line
Figure 24 - Mussulo peninsula, view of one of the middens found on the edge of a beach. The average thickness of the shells (the mabangas only) is only a few centimeters on the periphery. In the center of the midden, it can be up to several tens of centimeters. At the center of the photo, there is a metal container that served as a brasero (photograph: N. Valdeyron).

Figure 25 - Mussulo peninsula, close-up of a midden with a simple and nearly complete system of operation: an elementary cooking structure composed of a few bricks on which a grill was probably placed, the old burlap sack in which the shells were carried, a stock of small branches and roots used as stock of fuel and, mixed with the other shells, those whose meat was consumed in place. The only things missing are the tools used to open the shells, which were probably taken away from the site. The operating time of the system was definitely very short (photograph: N. Valdeyron).

Figure 26 - Mussulo peninsula, another “station” on another midden. The system is nearly identical to the preceding one (shells, bricks around a small circular fireplace, burlap sack, stock of fuel), but the brasero, which was not used to cook the mabangas, along with the plastic plate and tongs, add a touch of modernity (photograph: N. Valdeyron).
the edges, probably to delimit the fireplace and perhaps to support a cooking grill, though none have yet been discovered. Inside the feature, there are gray ashes, a few charcoal fragments, numerous partially burned twigs, and a variable number of shells. The latter are usually entirely and intensively burned and often reduced to small fragments (figure 27). It is possible that they accidentally fell into the fireplace or that they were already present on the surface of the midden when the combustion feature was constructed. There is little chance, on the other hand, that their state reflects an intentional act linked to the preparation of the flesh of the mollusks: if this were the case, all of the shells in the accumulation would display the same degree of alteration and ustion, and therefore, the same gray color, which is far from the case. Through cooking experiments at different degrees of heating and tasting sessions, we could easily test and model these different parameters and identify some of the conditions of the functioning and constitution of this type of midden. Moreover, the alteration of the shells appears to correspond to processes other than those induced by cooking: probably as a result of their exposition to the sun, the dark color of the shell fragments at the moment of their collection is progressively lost. This observation provides new elements that can contribute to our understanding of the formation of these middens, as well as that of their older counterparts, by making it possible to identify during excavation the different phases of shell accumulation, and perhaps even to determine its pace and intensity. The alternation between more or less thick layers of white shells, with a phase of abandonment of the midden during which the upper part of the accumulations was subject to atmospheric agents, and layers of darker shells, could thus compensate for the very low sedimentation rate and facilitate the vertical exploration of these accumulations.

Figure 27 - Mussulo peninsula, close-up of part of layer of shells belonging to the preceding midden. We can see a small concentration of totally burned mabangas near the charcoal and ashes, all of which is more or less covered with non burned shells: this is likely an old dismantled cooking structure, covered over with new waste (photograph: N. Valdeyron).
We were not able to make detailed observations of the other middens. They nonetheless appear to follow the same general pattern as the preceding midden, indicating regular human occupations, but of a short duration and low intensity. At this stage in our research, this is what seems to be indicated by the small size of the fireplaces, the rudimentary nature of their construction, and the lenticular form and thinness of the deposits. The constitution of these middens would thus correspond to domestic dietary activities.

5.2 - Praia da conchas

In 2007, the surveys realized in the southern part of the lagoon, in the Morro dos Veados sector, revealed a group of *Arca senelis* middens located on both side of the road. Of a variable size and shape (figure 28), they appeared to us to be less recent than those of Mussulo (none displayed traces of recent use), though not very old either. A local fisherman confirmed this impression and informed us that these accumulations were in fact only a few dozen years old. They are apparently situated on a zone that was once rich in shells, and were exploited for as long as it was deemed profitable, before being abandoned for more interesting sectors.

Among these latter sectors, the appropriately named Praia da conchas beach constituted both the highpoint and the end of our expedition around the lagoon. This small locality is occupied by the natives of Cacuaco, the island of Luanda and Benguela, these latter having journeyed 1000 km to escape civil war. Starting in 1996, after the former fishing spot, Soba beach, had to be abandoned due to urban expansion; this beach became both one of the main locations for traditional fishing and *mabanga* collection, as well as one of the largest markets on the lagoon. The collection and processing of shells, which was intensive and seasonally organized due to the difficulty of preserving mollusk meat (two days at most if it is not cooked), lasted throughout the cold season, called “Cacimbo”. The collection is represented in a spectacular manner: the ground is covered with shells over thousands of square meters and dozens of centimeters in depth (figure 29) and, at least at the time of our first view of the site in 2006⁵, a shell midden of nearly 50 m³ spread to the edge of the beach (figure 30). This “archaeological” signature is much different than what we had observed until now for recent middens, such as that of Mussulo. The existence of these

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5. In 2007, it had completely disappeared, being sold to a public works company who used it to pave roads and parking lots.
immense and continuous layers of shells and the absence of combustion features directly associated with them indicated that the traditional and commercial nature of this collection went well beyond the domestic sphere, even if the unit of production was the family. Several inquiries (Domingos, 2009) provided information on the technical, economic, and even social conditions surrounding this activity.

The exclusively male fishermen arrived at around 5:00 or 6:00 in the morning and embarked in their crafts powered by oars, sails or, much less often, a motor. To reach the island of Mussulo, it took two hours for those with no motor. When they arrived at the island, they waited for low tide and free-dove, with no equipment except for a mask or glasses, to hand-collect the shells and put them into a bucket called a “bunker” or “cabetula” (figure 31). Some fishers dove with a backpack full of sand that served as a ballast; they then emptied it into the water so that they could fill it with shells. When the tide began to rise, they stopped working.

Figure 29 - Praia da conchas, the beach in one of the shell processing zones. Mabanga shells cover the ground. The sand is visible in only a few places where they were pushed into it by people walking (photograph: N. Valdeyron).

Figure 30 - Praia da conchas, shell midden in the process of being formed. It was photographed in April 2006, and then disappeared in 2007 after the shells had been sold to a contractor to be used in road construction (photograph: N. Valdeyron).

Figure 31 - Praia da conchas, return from a fishing trip. The wooden boat is half filled with shells. In the foreground we see the cabetula, a perforated plastic bucket used to lift the shells to the surface (photograph: N. Valdeyron).
- In the case of “plunder” fishing, they returned to Praia da conchas the same day, at around 14:00. If it was a “batida” fishing expedition, they left on Monday and did not return until Wednesday afternoon: the morning was devoted to shellfish, and the rest of the day to fish. When they returned, they sold their catch, fishes and mabangas separately, to the female merchants waiting for them (and with whom they often made arrangements in advance). The “bunker”, which constituted the unit of measure (between 5 and 10 liters) for the shellfish, was sold for between 35 and 40 kwanzas (Kz), or approximately 1 US dollar; for each daily expedition, they earned approximately 2500 Kz.
- The women (among which there was a strict hierarchy distinguishing the “boss”, who bought the shellfish, from the workers paid by her) then processed the shellfish (breaking, sorting and washing) to remove the flesh (figure 32). One of them, usually the “boss”, placed a shell on a stone (granite?) anvil and, using a stone hammer or a metal lag-screw (the latter, possessed by only a few women, was probably taken from the rails of a railroad) that was used as a hammer, struck the point of intersection between the two valves to open the shell (figure 33). Once a good quantity of shells was opened, two other women extracted the contents by hand using a still articulated shell in the manner of tongs. The flesh was then placed in a resistant sack (figure 34) that they then beat with a stick to remove the sand still adhering to the mollusks. The flesh was then washed and placed in another sack. This operation was repeated three or four times before the mollusks were stored in plastic tubs. The raw flesh was then ready to be sold. It was sometimes dried in the sun on plastic or fiber sacks. The empty shells were discarded near the woman who broke them, as they were being processed, in a very mechanical manner. They rapidly accumulated at the feet of the woman and a large continuous pile was formed, joining the workstations together.
- The next day, at their home, the women prepared the mabangas; they used an aluminum pot (not ceramic, which is rarely used for cooking). The raw mabangas were sold by the kilo (1 kg for 200 Kz). The cooked ones were placed in a tub and sold by the spoonful at the following prices: 1 coffee spoon = 10 Kz; 1 soup spoon = 20 Kz; 1 kg = 250 Kz. According to the merchants, they did not make a good profit, mostly due to the price asked by the fishers: one bucket of shells is not equivalent to a bucket of mollusks and the fishermen sold the shells at what were considered to be very high prices, with the justification that they risked their lives every day (oral communication, D. Mariana, mollusk merchant). This activity thus paid barely enough to survive. The earnings were irregular: when the demand was high, the activity was relatively profitable, but when the weather was hot and the shellfish died very fast, the demand decreased and the situation became difficult. The money earned was used to satisfy daily needs, especially feeding the family (oral communication, D. Margarida).

The inquiries made at Praia da conchas thus provided much information, showing that shellfish collection methods respected certain traditions (at least in technical terms6), but that the practice was also necessarily integrated into a changing world, which swayed further and further from these same traditions. Ten or twenty years ago, the collection of shellfish around Mussulo island was preceded by a ritual meant to protect the fishermen and ensure the success of their expeditions. The traditional authorities of Mussulo, Barra do Dande and Luanda Island gathered together for the ceremony and, once the shellfish were collected, they began the ritual itself, accompanied by

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6. “This sea trade, our parents also practiced it in this way. Meaning we saw them do it this way and that is how we do it also, in the way that we have explained it to you” (oral communication M. João Camuenho).
chants and offerings to Kianda, a mermaid who lived at the bottom of the ocean and whose goodwill had to be solicited. Today, this ritual has been completely abandoned; the mixing of populations, encouraged by the civil war, as well as the increased exploitation of shellfish, probably contributed to making it obsolete. Moreover, the low profitability of shellfish collection today leads us to wonder why the practice is continued at all. Beyond any economic reasons, it may serve a different function, which is to contribute to maintaining, or establishing, the social cohesion of poor, heterogeneous
groups – a cohesion that is probably disturbed by the long and fratricidal armed war – by encouraging the establishment, or maintenance, of strong hierarchies and a sexual division by establishing a sexual distribution of labor that resulted in a strict separation of men and women. A certain social violence in the social relations could argue in this sense. We detected on the beach, where we had the impression that the men, who were quiet and not very friendly, clearly supervised the work of the women to the point that we wondered if this behavior was not somewhat forcefully imposed.

From an archaeological perspective, what links can be drawn between the collection and fishing of mollusks as it is practiced today and how it was done on the Bay of Luanda a few centuries, or even millennia, ago? How can we use shell middens still in the process of formation to try to reconstruct how archaeological middens operated? The main midden of Praia da conchas, which we observed during its development, was formed very rapidly and within a very short time-span it attained 4 meters in height. The fishers and shellfish merchants associated this practice with other activities in the center of town, and were thus not present «full-time» at the site. Therefore, even if we do not know the size of the groups that constituted the old middens, it appears that relatively little time was needed to form a middle sized midden. Those explored at Cabolombo, for example, limited to a few shell thicknesses, could have resulted from a short, or even very short, occupation by a small group. The modern reference base that could be constituted by the recent middens found at Mussulo even with only a small number of test-pits, would allow us to clarify these points rather easily.

6 - Conclusion

In three field seasons, which represent only slightly more than a month in the field, we were able to collect a significant amount of information from both archaeological and ethnological sources. These data, most as yet unknown, show the strong potential of the Bay of Luanda to provide relevant information. It is thus a favorable area for observing the long and complex history of the settlement of this part of Angola. This settlement was established in a manner that was probably more or less transferable to all of the zones concerned, first by the Bantu expansion, and then by European colonization. Arca senelis, under its vernacular name “mabanga”, played an essential role in this inquiry, not only because its name was given to one of the largest archaeological sites in the sector, but also because it enabled us, due to its continuous collection, to explore the evolution of the cultural and socio-economic contexts in which this practice operated, and the capacity of archaeological research to reconstruct them.

From the perspective of broad cultural trends, and despite the scenarios that remain to be confirmed, we can consider the mission on which we embarked to be a success: the evolution of the use of mabangas indeed mirrors that of the communities by which it was collected. Whether we consider the shell collectors, probably belonging to the Bantu tradition, encountered at Cabolombo in test pit 1, or the Portuguese factory, which, at the same site, used mabangas as a raw material, or those at Kitala/Kambanga who made beads from them, probably for the Mani Kongo, the main stages of cultural history and peopling have been satisfyingly reconstructed. Nonetheless, due to their more ambiguous archaeological record, the cultural and socio-economic status of some of the populations is more difficult to apprehend, as is the case at Cabolombo, in test pit 4. This is even truer for test 14 at the same site, in which the simultaneous presence of indigenous groups and Portuguese colonists, given the known practices of the latter, raises the question of possibly servile condition of the indigenous populations, which is difficult to determine here. In this case, at least based on the type of remains considered here, we must recognize that the archaeological method appears to be rather ineffective.
Acknowledgements

The three field sessions reported in this article were funded by the SCAC of the French Embassy in Luanda and the project initiation funds of the TRACES laboratory. Some of the fieldwork was realized in collaboration with a dozen Angolan students registered in the anthropology class taught by Sonia Domingos at the Agostinho Neto de Luanda University. Maria-Helena Benjamin, head of the department of archaeological research at the Benguela museum also participated. The faunal remains of test pit 1 were identified by Sandrine Costamagno (TRACES, Toulouse). The two radiocarbon dates obtained from the same site were funded by the IFAS (Johannesburg) in the context of the ”Archives khoisan” program directed by François-Xavier Fauvelle. The information on the presence of shell middens on the Mossulo Peninsula was provided by François Croville, then cultural action and cooperation counselor at the French Embassy in Luanda; and it is he who took us there.

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