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Shellfishing and shell midden construction in the Saloum Delta, Senegal



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ABSTRACT

The Saloum Delta, Senegal, is renowned for its vast shell middens which date to at least 5000 BP and in many cases, also contain numerous burials. Though archaeological work has been conducted here for over 70 years, the focus has been on obtaining radiocarbon dating sequences and rescue excavation; little is known in detail about the middens or the people who built them. Today, the Sereer Niominka people of the Saloum Delta continue to collect and trade shellfish using traditional methods. This has offered an opportunity to observe these processes in practice, and examine the archaeological footprints they produce. These ethnoarchaeological observations have provided new perspectives on the development of large shell middens that will contribute to a better understanding of the archaeological landscape here and will also be of relevance to midden-rich environments, more widely.

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1. Introduction

Marine molluscs are edible, abundant, easy to process and available all year round. Archaeological evidence suggests they played an important role in the lives of mid-Holocene human populations as shell middens dating to this period occur in coastal areas around the world. However, there also is extensive evidence for the exploitation of coastal resources in earlier periods (Hardy, 2016) and the ready availability of shellfish has been used as an argument in favour of coastlines as hominin dispersal routes (Bailey et al., 2007; Mellars et al., 2013). Some shell middens are known from South Africa during MIS (marine isotope stage) 6 (Marean, 2010), dating to around 162,000 years ago (Jerardino and Marean, 2010) and from Bajondillo Cave, south Spain around 150,000 years ago (Cortés-Sánchez et al., 2011), while evidence for shellfish exploitation becomes widespread in these regions during the subsequent MIS stage 5 (130,000–71,000 years ago) (Cortés-Sánchez et al., 2011; Klein and Steele, 2013). In places the shell middens are comparable in size to those found in the later

mid-Holocene periods (Klein and Steele, 2013). However, coastal resources, including shellfish, are likely to have been exploited even prior to this; some insight into how this may have happened while leaving no enduring evidence is provided by long-tailed macaques that have been recorded breaking open and eating edible bivalves and gastropods using stone hammers, on the shore (Gumert et al., 2009; Gumert and Malaivijitnond, 2012; Tan et al., 2015). It has been argued that marine based resources became less important with the introduction of farming at the start of the Neolithic (Richards et al., 2003); however, there is widespread archaeological and historical evidence for their continued use in north-west Europe after this time (Hardy, 2015).

Shell, the waste from marine mollusc processing, is durable and has frequently been accumulated into middens which range from small scatterings of shells to huge landscape-changing mounds which can contain multiple burials. There are few guidelines about definition of these deposits except in relation to the Danish term kitchen midden (*Køkkenmødding*) which is used to define sites that have a volume of at least 50% marine shell and a size over 10 m² (Gutiérrez-Zugasti et al., 2011). Shell middens and mounds are found in their thousands on coastlines around the world including South Africa (Parkington et al., 1988), the West African coastline through Mauretania (Vernet and Tous, 2004), Senegal (Linares de Sapir, 1971; Mbow, 1997; Cormier-Salem, 1999; Camara, 2010), Guinea Bissau to Nigeria (Durand, 1994), Australia, Europe, the

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Middle East and America (Ceci, 1984; Trigger, 1986; Claassen, 1998; Cannon, 2000; Estévez et al., 2001; Hardy and Wickham-Jones, 2009; Orquera and Piana, 2009; Bailey et al., 2013a and all chapters therein). They have been a subject of interest since the 19th century (Lacaille, 1954; Andersen and Johansen, 1986; Waselkov, 1987), but despite this longevity of study and their visibility and abundance, they are not well understood. They vary hugely, they can be complex and expensive to excavate, and at times their sheer size and abundance is overwhelming. A purpose beyond practical waste discard has sometimes been sought for huge shell accumulations; for example the huge sambaqui shell mounds found in Brazil have been interpreted as specialised elements of settlement systems and burial locations, impregnated with symbolic meaning, possibly representing a cult of ancestors (Gaspar, 1999; Gaspar et al., 2008).

Subsistence shellfishing is likely to have been practiced widely in the past and today it is known to continue in many places (Kyle et al., 1997). Ethnographic and ethnoarchaeological work on small-scale traditional shellfishing has been conducted in several places (Meehan, 1982; Bird and Bliege Bird, 1997, 2002; Thomas, 2002, 2007a, 2007b; Jones, 2009a, 2009b; Ono, 2010); however, there have been few opportunities to witness a population involved in traditional shellfishing for trade. The Saloum Delta, Senegal, is renowned for its numerous vast shell middens which date to at least 5000 BP, while historical records dating from the 15th century AD onwards provide detailed information on the shellfishing industry from this time (Fernandes, 1951; Cormier-Salem, 1999; Camara, 2010). Additionally, the Sereer Niominka people of the Saloum Delta continue to combine seasonal agriculture with fish and shellfish trading, while accumulating shell waste into middens and mounds. This offered an opportunity to obtain insights into some of the practical and social processes involved in midden formation today, in a region with a long term ethnohistorical and archaeological record of shellfishing and shell midden construction. A joint Spanish-Senegalese research project was established, initially to investigate the archaeological shell middens here; however, their abundance and size, together with the dynamic nature of the coastal landscapes (Ausseil-Badie et al., 1991), the logistical difficulties of working in this area of islands and mangrove swamps, the absence of modern infrastructure and the cost, mean that large scale archaeological fieldwork here is challenging. The project was therefore modified and became an observational study with the aim of obtaining insights into the way shell middens develop in the Saloum Delta today. We examine modern shellfish processing methods and discard patterns and we provide examples of the archaeological footprints they leave. We also examine the settlement structure, some of the ways the role and significance of shell middens can change over time, why the shell waste is accumulated into middens and the link between shell midden abundance and marine biodiversity. The study area comprises the north-west part of the Delta, which contains five permanent villages; Diakhanor, Djifère, Palmarin, Falia, Mounde, Niodior (Fig. 1). Our information came principally from observation, though some informal conversations took place; these were conducted in French, Sereer, Wolof, and Peul (Fulani).¹ At all times several of us were observing and results were discussed and correlated each day. We focused primarily on Falia, an island

village around one hour from the mainland village of Djifère by motorised canoe. We also visited the village of Mounde, connected at low tide to Falia and reached in around one hour by horse drawn transport or canoe, and Diakhanor on the south-facing shore of the mainland.

2. The Saloum Delta, geography and people

The Saloum Delta is an area of unspoiled mangrove swamp approximately 120 km south of Dakar, in Senegal, West Africa. It covers around 2500 km² (Bocoum et al., 2010), and is a National Park and a UNESCO Biosphere reserve with a rich marine and terrestrial biodiversity. It presents as a series of small sandy bays, multiple islands and estuaries and has a rich natural environment based largely on mangroves; these represent part of the vast West African mangrove forests which stretch southwards to Ivory Coast and beyond. Sedimentation has created mudflats which are the habitat of many marine molluscs (supplementary 1, 2). Today, the Sereer people occupy much of west Senegal. Niominka is the Sereer word for fishermen, and the Sereer-Niominka are fisher-collector-farmers who base much of their economy on marine resources and occupy the region of the Saloum Delta.

The population is structured around small permanent villages and a decreasing number of seasonally occupied temporary villages. Today's permanent villages were established between the 8th and 18th century AD; they lie on sandbanks or natural accumulations of *Anadara senilis* L., (West African bloody cockle) and continue to expand as shells accumulate. Permanent villages are larger than temporary villages and have communal structures, including religious centres and schools (Sall, 2013). They are often surrounded by ancient shell middens and have field systems nearby (Fig. 2). Historically, there are two types of temporary village: shellfish gathering villages and fishing villages. Though each temporary village has its own name each with a specific meaning (for example, Mbembagne = little shell; Kolane = long way away; Touloucouna = skin stuff; Andiroba = net), the generic name for the temporary villages translates as 'isolation'. The number of temporary villages recorded for Falia is eight. All villages fall in a radius of approximately five kilometres from Falia (Fig. 3). The shellfish collecting temporary villages, even when abandoned, are easy to find and archaeologically recognisable. For example, the shell midden village of Kolane, is the most distant of Falia's temporary villages. It only ceased to be used 10–20 years ago; prior to this, families would transport rice and water and stay collecting and processing shellfish during the whole of the dry season. It comprises a large shell midden with several baobab trees on it, and within which it is still possible to locate an old cooking area as a hollow near the centre of the midden. However, the huts and even any indication of their locations on the midden are no longer visible.

While the shellfish processing temporary villages are often monuments in the landscape, little remains to identify the fishing villages, even though they were an important part of life. Whole families would spend four to five months at a time living in them and in some cases they also only ceased to be used around 20 years ago. Many people still remembered living in these fishing villages; during these times the focus was on fishing and only small amounts of shellfish were collected for individual or family consumption. Small spreads of cockle shells identify the outlines of huts while oyster shells were placed in small piles behind the huts. In one abandoned village an old lean-to was still in place; however, apart from this circles of shells, either four or two metres in diameter, were the only surviving evidence of habitation in these villages (Fig. 4). In the temporary village of Faupan the outlines of 20 houses were identified.

¹ Sereer is the language used by most inhabitants, though some people also speak Wolof and/or French. A small number of Peul (Fulani) speakers also live in the region. Wolof is spoken by all Senegalese authors, Sereer, and Peul by some of them. French is spoken by all authors. The information on Fat Roog and pangols was provided by the Sereer authors (Dioh and Gueye). Camara, Gueye and Diop began systematic work in the Saloum Delta in 2000, in collaboration with H. Bocoum and A.A. Seck. The ethnoarchaeological field project began in 2011 after a preliminary visit to the Saloum Delta in 2008. Two field trips of 14 days, in March 2011, and January 2012 were made; subsequent visits have been made by Dioh, Camara, Gueye and Hardy.

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