

## Maritime and underwater archaeological explorations in Kenya: Recent discoveries

Caesar Bita

National Museums of Kenya, Fort Jesus Museum, Mombasa, P.O. Box 82412, 80100,  
Kenya

Email: [mcbita@yahoo.com](mailto:mcbita@yahoo.com)

### Abstract

*Kenya is the first sub-Saharan African country to initiate an underwater archaeological expedition thus legally recognizing the value of underwater cultural heritage. This was after successful survey and excavation of the 17th Century Portuguese shipwreck, Santa Antonio De Tanna, in Mombasa. Kenya coast is part of the Western Indian Ocean; commonly referred to as the 'Swahili coast'. This coast was a domain of foreigners from the early centuries of the first millennium AD. It was visited by the Greeks; controlled by the Arabs, Portuguese and the Europeans. In addition, it played a major role in ancient transoceanic maritime trade across the Indian Ocean Seaboard linking the Swahili Coast with the Arab world, India sub-continent, Far East and China, America and Europe. Owing to crude navigation and sea faring technologies of the time, there are on the seabed of Kenya traces of these interactions in the form of archaeological remains. Recent studies have shown that the Kenya coast is home to a number of shipwrecks and has immense potential in underwater cultural heritage. Drawing from ancient literature, previous and current maritime and underwater archaeological studies, and this paper presents the recent discoveries from underwater archaeological surveys in Kenya. The paper illustrates that there is immense potential for underwater archaeology in Kenya that requires new attention both in research and conservation.*

**Key words:** Swahili Coast, Lamu archipelago, Malindi, Maritime Archaeology  
Underwater Cultural Heritage, Shipwreck

### Introduction

The conservation of maritime and underwater cultural resources has become a major field of great scientific and regional importance world over. Maritime cultural heritage is a critical element of Kenya's wellbeing. In addition to its intrinsic value, it provides us

with important space for recreation and has a significance that makes it worth preserving; it is part of the environment, has an economic and scholarly value. This resource is however under ever increasing pressure from human activity. Its protection is thus a key part of sustainable development, whereby policies to encourage social and economic development should be equaled by policies to protect our environment. To effectively protect this heritage one important step is to document how much of this resource is available.

The National Museums of Kenya (NMK) cannot afford to rely on “accidental” discoveries by non-scientific ventures and still remain an authentic custodian of the national heritage. It is for this that Kenya has made efforts to implement the preservation of underwater cultural heritage (UCH). The country has developed capacities in maritime and underwater cultural heritage through the training of underwater archaeologists and establishment of an underwater artifact conservation laboratory. NMK has designed a maritime archaeological programme for the study of this heritage as well as a database of all shipwrecks in the country. These efforts are expected to increase the dimension in which we understand and interpret this heritage in addition to mitigating the risk of losing this resource to vandalism and uncontrolled development.

### Maritime History of the Kenyan Coast

Kenya is a maritime country with a coastline approximately 600 km long with many small islands and navigable channels.



This coast, which is part of the Western Indian Ocean (WIO), commonly referred to as the ‘Swahili coast’, was a major player in the ancient transoceanic maritime trade across the Indian Ocean Seaboard. Its inhabitants are known to have had a history of long and continuous interaction with not only the Indian Ocean but also foreign visitors including the Greeks, Arabs, Portuguese and the

1 Fig. 1 Trade goods exchanged across the Western Indian Seaboard. (C. Bitu)

Europeans. Further, several early Swahili settlements ranging in time from the 8th-17th centuries AD dot both the entire coastline as well as its off-shore islands (Garlake, 1966; Chittick, 1984; Horton, 1984; Abungu, 1989; Bitu, 2011b). Such include Mombasa, Lamu, Pate, Faza, Dondo, Kiunga, Ishakani, Ungwana, Siyu, Kilepwe, Mambrui, Malindi, Gedi, Jumba La Mtwana and Kilifi. These ancient towns linked the Swahili Coast and other continents across the Western Indian Ocean seaboard including the Arab world, India sub-continent, south East Asia, the Far East and China, America and Europe (Fig. 1).



Fig. 2 Figure showing the concentration of shipwrecks along the Kenya coast. (C. Bitu)

Several historical records make reference to ancient seafaring off the Swahili coast. The *Periplus of the Erythraean Sea*, a document by an anonymous Greek sailor, mentions the east African coast as early as 2000 BP (Freeman-Grenville, 1962; 1975; Wright, 1984; Horton, 1990; Whitehouse, 2001;

Chami, 2006). Records by Chinese travelers refer to the Somali coast and her trade connections with the Far East by late 800s AD, while reports by Arab geographers allude to thriving maritime communities on this coast by 900 AD (Kirkman, 1964; Dato, 1970; Martin, 1973; Freeman-Grenville, 1975; Horton, 1990; Hall, 1996). The period between the first millennium BC and the 2nd half of the first millennium AD was characterized by crude shipping technology and lack of nautical charts. These crude navigation technologies, as well as oceanic changes, are likely to have made early seafarers casualties of coral reefs and violent sea waves. In addition, the East African coast has been a centre of rivalry between major powers and the resultant wars

witnessed a number of marine armour destroyed and sunken in these waters. This evidence is today lying on the sea-bed and foreshores in the form of shipwrecks, anchors, military structures among others (Bitá, 2014). In Kenya this underwater archaeology comes to light from researches, accidental discoveries by fishermen, written records and oral tradition. Recent investigations that corroborate historical literary sources have shown that the Kenya coast is home to a number of ancient shipwrecks. Studies have shown the highest concentration of these sites in Kenya to be around Mombasa, Malindi and Lamu (Fig. 2) (Breen and Lane, 2003; Forsythe et al., 2003; Bitá, 2008; 2010; 2011b; 2014).

### **Maritime and Underwater Archaeological explorations in Kenya**

There are significant pointers towards the richness of Kenya's maritime and underwater cultural heritage. A survey to establish the full range of this resource is ongoing in the country. The objectives of this undertaking are to identify and understand the range and distribution of this resource in the Kenya coast and to develop a database of the maritime and UCH sites for further archaeological investigation and conservation. Kenya initiated an underwater archaeological expedition after successful survey and excavation of the 17th century Portuguese shipwreck in Mombasa. This Portuguese frigate was sunk by Oman Arabs in 1698 in Mombasa during a battle to free Fort Jesus from the Arabs (Piercy, 1977; 1978; Sassoon, 1980; Boxer, 1960; Lynch, 1991; Patience, 2006). Following this development, this shipwreck, later dubbed 'Mombasa Wreck', was gazetted as a national monument and is today protected by the country's legislation. It is this initiative that made Kenya the first east African sub-Saharan country to legally recognize the value of underwater cultural heritage. In the subsequent years, there was a growing importance of underwater archaeology including management of UCH in Kenya. With the potential of underwater archaeology in the country, a new research and heritage management perspective was required. As such, Kenya sought to develop capacities in underwater cultural heritage management through training and infrastructure development. The country has trained two underwater archaeologists, three conservators of underwater cultural material and has a well established underwater artifact conservation laboratory. Additionally, a database of maritime and

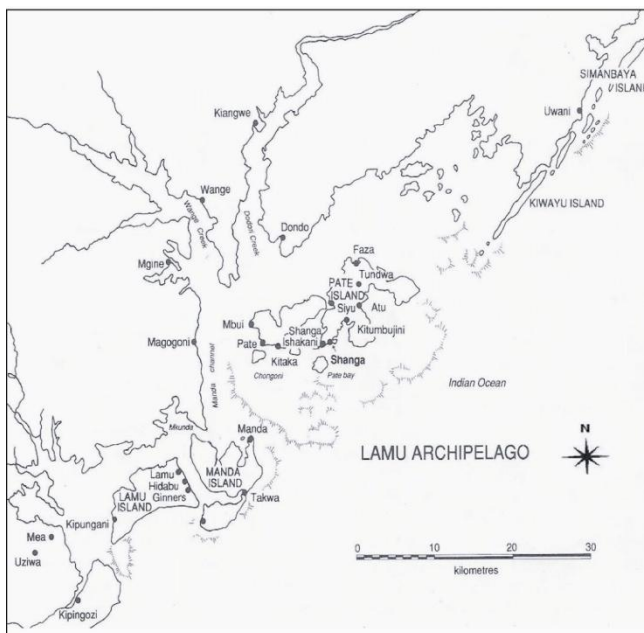
UCH sites has been developed for the coastal region and undersea cultural heritage impact assessments are conducted as part of these efforts.

### Recent Discoveries

Several underwater surveys have been undertaken off the Kenyan coast in which a lot of archaeological heritage has been documented. These surveys include a 2001 maritime archaeological study of Mombasa Island (Breen and Lane, 2003). Others are the 2006-2009 surveys in Lamu, Malindi and Mombasa by NMK (Patience, 2006; Bitu and Wanyama, 2007; Bitu, 2008; 2009 a-b). The latest, and ongoing, is the survey by National Museums of Kenya in collaboration with National Museums of China, in the “Sino-Kenya Underwater Archaeology project” (Bitu, 2011a; 2013a). In these surveys numerous maritime and underwater heritage sites have been documented including shipwrecks, structures and artifacts. Interestingly these have been found to occur around the ancient towns of Lamu, Mombasa and Malindi; towns that played a major role in the ancient transoceanic interactions across the Western Indian Ocean (Fig. 2). Underwater archaeological surveys have also focused on these important towns.

#### *Underwater Archaeological survey in Mombasa*

Mombasa Island borders the open sea to the south east and has several channels.



*Fig. 3 Lamu Archipelago: the eastern shores have many rock outcrops where ancient ships are believed to have sunk while entering Lamu Town. (C. Bitu)*

There have been numerous underwater archaeological surveys of this island in the previous years that realized a lot of maritime and underwater cultural heritage sites. The first survey undertaken was the excavation of the *Santa Antonio* shipwreck which recovered Indian wares, Chinese porcelain, Martaban and Portuguese jars, canons, mortar shells and bronze medallions (Piercy, 1977; 1978; Bitu, 2013b). A later survey revealed several

anomalies, some being shipwrecks (Breen and Lane, 2003; Forsythe et al., 2003). Recent surveys (Bitá, 2009b; 2011c) have recorded wreck sites and associated structures (Fig. 3).

#### *Underwater Archaeological survey in Lamu archipelago*

Lamu archipelago is composed of several islands but the main ones are Lamu, Manda and Pate, all with ancient towns by the same names (Fig. 3). Ancient settlements in this archipelago are important landmarks in the history of the Swahili Coast. They were important centres of the northern Swahili world with some, like Manda and Pate, exhibiting evidence of very early occupation (Chittick, 1984; Horton, 1987; Wilson and Omar, 1996; 1997). Ancient Pate Bay for instance was the gateway to Lamu Town for sea travelers. Even up to the present, the eastern shores of this island are referred to by the locals as *mlango wa Lamu* (gateway to Lamu). This route was used by the Portuguese for decades controlling the WIO trade (Kirkman, 1964; Freeman-Greenville, 1975; Chittick, 1976; 1984; Hall, 1996). The Arabs dominated the Swahili Coast long before the Portuguese and used this route for hundreds of years in trade with the Persian Gulf (Bitá, 2011b).

Pate Bay has several long reefs and many coral rock outcrops such as *Pazzali*, *Hassani* and *Hanawi*. These rocks are at the confluence of Pate channel and the open sea and being submerged at high tide suggests many vessels may have wrecked here. In addition, the lack of nautical knowledge for this area caused many early seafarer casualties on these coral rocks when sailing through this bay. Over the years, fishermen in the Lamu archipelago have been recovering archaeological materials at various sites along these



*Fig. 4 Portion of a shipwreck embedded in concretion in Mombasa waters. (Coastal Archaeology, National Museums of Kenya)*

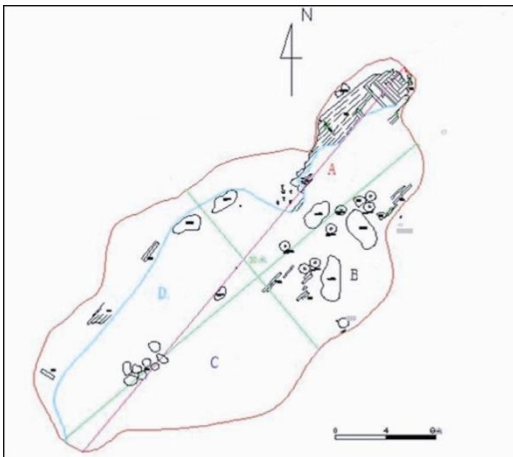
reefs and channels in addition to seabed surveys (Bitá and Wanyama, 2007; Bitá, 2009a; 2014). Recent surveys in Lamu have made major achievements in terms of the volume of artifacts recovered; sites surveyed and amount of data collected. Geophysical studies have recorded several underwater anomalies while sites identified include areas with concentrations of pottery and iron anchors (Bitá, 2014). A massive anchor approximately 4m long with 2m long hooks was found (Fig. 4). Standing upright and embedded in coral, one of its hooks is however missing (this suggests probably its line was cut when sailors were unable to take it back into the ship). Similar types of anchors have also been recovered in Mombasa. Small iron anchors 2m long heavily encrusted and of 3 hooks have also been recovered. This style of 3 hook anchors is not a common feature of the Swahili Coast and suggests they belong to foreign ships. Early travel across the Western Indian Ocean was subject to the monsoon winds which alternated every six months. For instance, foreign traders sailed to the East African coast on the northwest monsoon wind which blows from November until April. For six months they would wait for the winds to change direction in order for them to sail back home on the southeast monsoon winds which blow from June to October. During this period of wait, ships would be anchored for loading and repairs while the sailors engaged in trade. Similarly, due to ocean currents and long wait, the ship anchors would, in most cases, be covered in sand or dragged into rock crevices. Such would make them difficult to pull back into the ship at departure forcing the crew to cut the ropes and abandon the anchor underwater. As is the case with Pate channel, many areas have silted over the years with many sites heavily covered in the sands (Bitá, 2014).

#### *Maritime Archaeological Survey in Malindi*

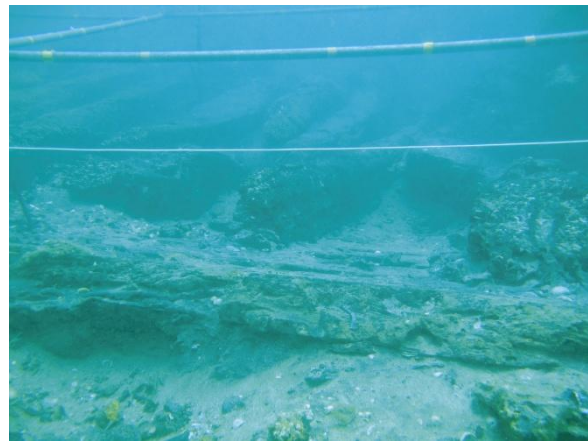
Malindi town is located 120km north of Mombasa and is one of the ancient trading towns which had contact with the outside world in the last centuries of the last millennium. The town owes, as do many other coastal towns, its origin and prosperity to the Western Indian Ocean for facilitating transport and trade. It was at one time a gateway where the movement and transformation of goods were facilitated and urban services developed to promote maritime trade (Bitá, 2008). It is believed to have been visited by a Chinese fleet in the 15th century. When the Portuguese arrived on the Kenyan coast in 1495, they found a thriving town and made it their trade headquarters



while monopolising the WIO trade (Hall, 1996; Martin, 1975; Bitá, 2012). Malindi Bay has three ancient centres, Malindi town, Mambui and Ngomeni. Mambui and Malindi were vibrant agricultural regions while Ngomeni was known for production and export of mangroves (Bitá, 2005; 2008). In trading areas, shipwrecks would be closer to certain shipping hazards such as reefs and projecting headlands. In Malindi Bay, Ngomeni is located near a headland whereas in Malindi town there is Leopard Bay, the navigation channel of which is between two reefs. In the two areas, many ships are suspected to have sunk (Patience, 2006; Bitá, 2008; Bitá, 2011a-b; 2012). Portuguese records mention their ships lost and sunk in Malindi and whose locations have not been found (Patience, 2006). Maritime and underwater archaeological surveys in the area have documented several shipwrecks (Bitá, 2005; 2008; 2011a) including remains of a ship engine block, sites containing 14th-15th century Indian and Chinese pottery (Bitá, 2008; Bitá, 2011a). This corroborates Portuguese and British records of ships lost in Malindi waters (Patience, 2006).



*Fig. 5 The plan of the Ngomeni Ras shipwreck site. (Sino-Kenya Underwater Archaeology project)*



*Fig. 6 The remains of the Ngomeni Ras shipwreck lying on seabed. (Sino-Kenya Underwater Archaeology Project).*

### *Ngomeni Ras Shipwreck*

While no UCH sites have been located in Mambui, 10km north of Malindi Town, in Ngomeni, a village about 30 km northeast of Malindi town, several important sites have



been identified. Ngomeni stands on an arm of land jutting towards the sea (Ras Ngomeni), which offers a protected shallow harbour formerly used as a gateway for all seafarers from Lamu to Malindi (Wilson, 1982; Bita, 2008; 2011b). The area was known for mangrove growing which was exported to, and used in house construction in cities around the Persian Gulf (Wilson, 1982; Whitehouse, 2001). Surveys in 2008 discovered a wooden shipwreck that consistently produced materials dating to the 14th century including Persian and Far Eastern wares. The shipwreck was revisited in 2010-2011 and excavated in 2013. The exposed wood remains of this site are however seriously threatened by terredo. Ngomeni Ras Shipwreck is a probable 15th-16th century merchant ship. The site measures 40m x 20m lying 5m below the sea (Fig. 5-6). This discovery has proved the town participated in ancient mangrove trade across the Western Indian Ocean (Bita 2011a-b; 2013a).



*Fig. 7 A militant bunker overlooking the sea in Mombasa. (C. Bitá)*



*Fig. 8 Lime and stone jetties and sacred sites on the maritime zone of Mombasa coast. (C. Bitá)*

### **Intertidal and Foreshore surveys**

Intertidal and foreshore surveys have also documented a rich resource of cultural heritage. Irrespective of typology, these sites existed to exploit the maritime resource that is the Western Indian Ocean. The most important include ancient forts, redoubts, anchorages, ports and jetties. Others are maritime practices such as boat building and fishing styles. It is their relationship with this ocean that makes them worth studying and conserving.

### *Military structures*

Ancient East African coast was a centre of rivalry between powers such as between rivaling Arab rulers, Arabs and Portuguese and later in the 1st and 2nd world war between Germans, British and Italians (Coupland, 1938; Kirkman, 1964; 1974; Martin, 1973; 1975). These witnessed a number of marine structures erected along the coast as defense forts or escape tunnels (Bitá, 2009a-b). The Kenyan coast is awash with such, including redoubts, forts including Fort Jesus, Siyu and Lamu, as well as habitable caves and military bunkers. A majority of these are associated with Arabian, Portuguese and British periods (Fig. 7).

### **Moorings, Anchorages, Jetties and sacred sites**

Intertidal surveys have recorded ancient moorings and anchorages of different styles (ranging from metal, lime and stone), ruins of jetties built of stone and lime (Fig. 8). A majority of these have been attributed to the Portuguese and British periods. Jetties may probably be related to old crossing points from the Islands to the coastal mainland. Other equally important features are the sacred sites that are manifestations of the relationship between people's beliefs and the elements of maritime environment. Most shrines are located in rock shelters, caves and secluded places on the seaward side of cliffs (Bitá, 2009b). The traditional ritual paraphernalia including talismans, white and or red pieces of cloth; mixed colours of red, blue, white and black are mostly strategically placed so as to come in contact with sea water at high tide.

### **Acknowledgments**

I am thankful to the Director General, National Museums of Kenya, for his support and nominations to the training in Underwater Archaeology. I am also grateful to UNESCO for the sponsorship to train in the 3rd Foundation and In-Situ Preservation of Underwater Cultural Heritage courses in Thailand and participation in the Abuja UCH meeting. Thanks too to the Chinese government for the bilateral cooperation in underwater archaeology research in Kenya.

## References

- Abungu, G. O., 1989. *Communities on the river Tana, Kenya: An Archaeological study of relations between the Delta and the river basin, 700-1800 AD*. PhD Thesis, University of Cambridge, Cambridge.
- Bitá, C., 2014. The potentials of underwater archaeology in Kenya: A short communication. In Sila Tripathi (Ed.), *Shipwrecks around the world: Revelations of the past*, Delta Book World, New Delhi: 486-510.
- Bitá, C., 2013a. Underwater archaeological survey of Ngomeni Shipwreck site. *SINO-Kenya Underwater Archaeology Project Report*. National Museums of Kenya, Mombasa.
- Bitá, C., 2013b. Martaban jars found in Kenya. *Southeast Asian ceramics museum Newsletter*. Vol. VII (1) Jun-Sept 2013: 3.
- Bitá, C., 2012. *The Origin of Malindi Town: A Case Study of Mambrui*. M. A. Dissertation. University of Dar es Salaam. Dar es Salaam.
- Bitá, C., 2011a. *SINO-Kenya Underwater Archaeology Project. Preliminary Report*. National Museums of Kenya, Mombasa.
- Bitá, C., 2011b. Ancient Afro-Asia links. New evidence from a maritime perspective. In Mark Staniforth et al., (Eds.), *Proceedings on the Asia-Pacific Regional Conference on Underwater Cultural Heritage*, 8-12 November 2011, Manila: 289-301.
- Bitá, C., 2011c. *Cultural Heritage Impact Assessment for the Lion 2 Undersea Fibre Optic Cable in Mombasa*. National Museums of Kenya, Mombasa.
- Bitá, C., 2010. *Protection of maritime and underwater cultural heritage in Kenya*. Paper presented to the International Conference on Maritime Cultural Heritage, Alexandria, Egypt.
- Bitá, C., 2009a. *Inter-tidal and foreshore survey of Pate island*. Survey Report, Fort Jesus Museum. Mombasa.
- Bitá, C., 2009b. *The intertidal and foreshore archaeology of Mombasa Island: An inventory of maritime sites*. Survey Report, Fort Jesus museum, Mombasa.

- Bitá, C., 2008. *The Western Indian Ocean Maritime Heritage: An overview of the maritime archaeological heritage in Malindi*. British Institute in Eastern Africa, Nairobi.
- Bitá, C., 2005. *Malindi. A Review of the History of a Coastal Town at the mouth of River Sabaki, Kenya*. National Museums of Kenya, Malindi.
- Bitá, C., and Wanyama, P., 2007. *Preliminary intertidal and underwater archaeological survey of Lamu archipelago*. Research Report, Fort Jesus Museum, Mombasa.
- Boxer, C. R., 1960. *Fort Jesus and Portuguese in Mombasa*, British Museum, London.
- Breen, C., and Lane, P., 2003. Archaeological Approaches to East Africa's changing Seascapes., *World Archaeology*, Vol. 35 (3): 469-89.
- Chittick, H. N., 1976. An archaeological reconnaissance in the Horn: the British-Somali Expedition 1975. *Azania*, Vol. 11: 117-34.
- Chittick, N., 1984. *Manda: Excavations at an Island Port on the Kenya coast. Memoir No. 9*, British Institute in Eastern Africa, Nairobi.
- Coupland, R., 1938. *East Africa and its invaders*. Clarendon press, Oxford.
- Chami, F., 2006. *The Unity of African Ancient History: 3000 B.C. to AD 500*. Dar es Salaam, E and D Vision Publishers.
- Datoo, B. A., 1970. Rhapsa: The location and importance of East Africa's first port. *Azania*, Vol. 5: 65-77.
- Forsythe, W., Quinn, R., and Breen, C., 2003. Subtidal archaeological investigations in Mombasa's Old Port. In P. Mitchell., A. Haour, and J. Hobart (Eds.), *Researching Africa's Past: New Contributions from British Archaeologists*, Oxford University School of Archaeology Monograph 57, Oxbow Books, Oxford: 133-138.
- Freeman-Grenville, G. P., 1975. *The East African Coast: Selected documents from the first to earliest nineteenth century*. Clarendon Press, Oxford.
- Freeman-Grenville, G. P., 1962. *The Medieval History of the coast of Tanganyika*, Oxford University Press, London.

- Garlake P. S., 1966. *The early Islamic architecture of the east African coast*. Nairobi. Oxford University Press, Oxford.
- Hall, R., 1996. *Empires of the Monsoon*. Harper Collins, London.
- Horton, M. C., 1990. The Periplus and East Africa. *Azania*, Vol. 25: 95-99.
- Horton, M. C., 1987. Early Muslim trading settlements on the East African Coast: New Evidence from Shanga. *Antiquaries Journal*, Vol. 67: 290-322.
- Horton, M. C., 1984. *The early settlement of the northern Swahili coast*. PhD Thesis, University of Cambridge, Cambridge.
- Kirkman, J., 1964. *Men and Monuments on the East African Coast*. Butterworth, London.
- Kirkman, J., 1974. *Fort Jesus: A Portuguese Fortress on the East African Coast*. Clarendon, Oxford.
- Lynch, M., (Ed.), 1991. The Mombasa wreck excavation. *Institute of Nautical Archaeology Newsletter*, Vol. 18 (2): 2-29.
- Martin, E. B., 1975. *The History of Malindi: A geographical analysis of an East African Coastal Town from the Portuguese period to the present*. East African Literature Bureau, Nairobi.
- Martin, E. B., 1973. *A History of Malindi*, Nairobi. East African Literature Bureau. Nairobi.
- Patience, K., 2006. *Shipwrecks and Salvage on the East African Coast*. Dar Akhbar Al Khaleej, Bahrain.
- Piercy, R, C, M., 1977. Mombasa wreck excavation, Preliminary Report. *International Journal of Nautical Archaeology*, Vol. 6 (4): 331-47.
- Piercy, R, C, M., 1978. Mombasa wreck excavation, Preliminary Report. *International Journal of Nautical Archaeology*, Vol. 7 (4): 301-19.
- Sassoon, H., 1980. *Mombasa Wreck Excavation*. Interim Report, National Museums of Kenya, Nairobi.

Whitehouse, D., 2001. East Africa and the maritime trade of the Indian Ocean AD 800-1500. In B. S. Amenoreti (Ed.), *Islam in East Africa: New Sources*, Herder, Rome: 411-424.

Wilson, T. H., 1982. Spatial analysis and settlement patterns on the East African coast. *Paideuma*, Vol. 28: 201-219.

Wilson, T. H., and Omar, A. L., 1997. Archaeological investigations at Pate. *Azania*, Vol. 32: 31-76.

Wilson, T. H., and Omar, A. L., 1996. Excavation at Pate on the East African coast. In G. Pwiti., and R. Soper (Eds.), *Aspects of African Archaeology*, University of Zimbabwe, Harare: 543-554.

Wright, H. T., 1984. Early seafarers of the Comoro Islands: the Dembeni phase of the 9th-10th centuries AD. *Azania*, Vol. 19: 13-60.

## **Biography**

**Caesar Bit** has a Masters degree in Archaeology from the University of Dar es Salaam, Tanzania; a Postgraduate Diploma in Management of Heritage and Museum Collections from the University of Nairobi, a Professional Diploma in Underwater Archaeology from Underwater Archaeology Center in China. Bit has participated in training programme such as Maritime Heritage Training and Integrated Coastal Zone Management Course (2006, Zanzibar, Tanzania), Regional Training on Maritime and Underwater Cultural Heritage Management (2010, South Africa), International Training Workshop on Preservation, Presentation and Education on Maritime Cultural Heritage (2010, Alexandria, Egypt). He participated in the 3rd UNESCO Foundation Course on Underwater Cultural Heritage and In-Situ Preservation of Underwater Cultural Heritage (2011, Thailand). He joined the National Museums of Kenya in 1999 and currently coordinating underwater archaeological research and underwater cultural heritage management at Fort Jesus museum, Mombasa, Kenya.