



Shoreline reconstruction of the submerged Minoan harbour morphology in the bay of Kato Zakros (Eastern Crete, Greece)



Nikos Mourtzas^{*}, Eleni Kolaiti

^a GAIAERGON Ltd, Athens, Greece

ARTICLE INFO

Article history:

Received 16 December 2016

Received in revised form 27 February 2017

Accepted 12 March 2017

Available online xxxx

Keywords:

Minoan palace

Kato Zakros, Crete

Sea level change

Geomorphological markers

Archaeological markers

Palaeoshoreline reconstruction

ABSTRACT

The Minoan centre of Kato Zakros flourished in a favourable geographical location, naturally fortified, in a leeward bay providing a natural harbour morphology. The submerged geomorphological markers of former sea levels define four distinct sea level stands, at -4.00 ± 0.30 m, -2.85 ± 0.30 m, -1.25 ± 0.05 m, and -0.50 ± 0.05 m. The dating of these sea levels was based on the gradual rise of the brackish groundwater, observed at the building relics and the water supply installations of the Palace, as well as on submerged coastal rock-cut structures. The oldest change in sea level is associated with the violent seismic disaster of the old Palace that occurred around 1600 BCE. The destruction of the new Palace occurred around 1450 BCE and is related with a strong seismic event that hit all the Minoan centres of Crete, but it did not cause any change in the relative sea level. The following sea level change is most likely related with the demise of the Minoan centres of Crete around 1200 BCE. During the historical period, two changes in relative sea level occurred. The first change is linked with the 1604 CE earthquake, and the most recent with the period of the last 400 years. The palaeoshoreline reconstruction of the Kato Zakros bay revealed a natural morphology, shaped by an elongate beachrock slab on the northernmost part of the western coast. Coastal responses to sea level rise include: progressive shoreline retreat, submersion of the natural harbour morphology and coastal fishing installations, and flooding of the Palace relics.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

The imposing and inaccessible mountains of Sitia isolate the easternmost tip of Crete from the rest of the island. These mountain ranges end abruptly into the sea, forming sheltered coves with small alluvial valleys fed by the debris of impetuous torrents that flow into the coast crossing the deep gorges of the inland (Fig. 1a). In these sheltered bays, even from the early Minoan times, were developed the main Minoan settlements of Itanos, Palaikastro and Zakros that reached their zenith in the Neopalatial period as mercantile relationships between eastern Mediterranean and Egypt were intensified (Fig. 1a).

The valley of Kato Zakros, naturally fortified with the surrounding steep limestone slopes, and the bay protected from the prevailing NW winds (see wind rose in Fig. 2b) seems to be a very favourable location for installing a port base (Fig. 1a, b, 2b).

Captain Spratt sailed into the bay of Kato Zakros in 1852. He described vividly the stepped bedrock morphology, the tortuous gorge and the stream ending into the plain of Zakros, and the Cyclopean remains of a very ancient and very considerable city (Spratt, 1865).

However, he erroneously believed this to be the ancient site of Itanos (Spratt, 1865).

At the close of the nineteenth century the archaeologist F. Halbherr, the explorer L. Mariani, and the excavator of Knossos A. Evans, based on Spratt's description visited Kato Zakros and reported the first archaeological evidence on it (Hogarth, 1901; N. Platon, 1974). The first systematic excavations of the site were made by D.G. Hogarth in 1901 (N. Platon, 1974). Sixty years later, the archaeologist N. Platon brought to light a Minoan Palace complex and a large part of the town surrounding it. The structure of the building remnants and rich mobile findings demonstrated that Kato Zakros was a very important harbour town and the starting point of the Minoan Thalassocracy connecting Minoan Crete with the great centres of the time in the Eastern Mediterranean (N. Platon, 1974).

Additionally, the discovery of the NE gateway and section of the harbour road from N. Platon (1974) led him to identify the location of mooring of the Minoan ships, in the NW part of the coast. The wide, slab-paved harbour road, originally built during the Protopalatial period, was the main road artery of Kato Zakros town (N. Platon, 1974). The high-level constructional features of the harbour road are indicative of the significant role in the economic and social life of the town (Salichou, 2012). Starting at the shore and following a western course led to the NE entrance of the Palace. It connected the harbour with the

^{*} Corresponding author.

E-mail address: nikosmourtzas@gmail.com (N. Mourtzas).

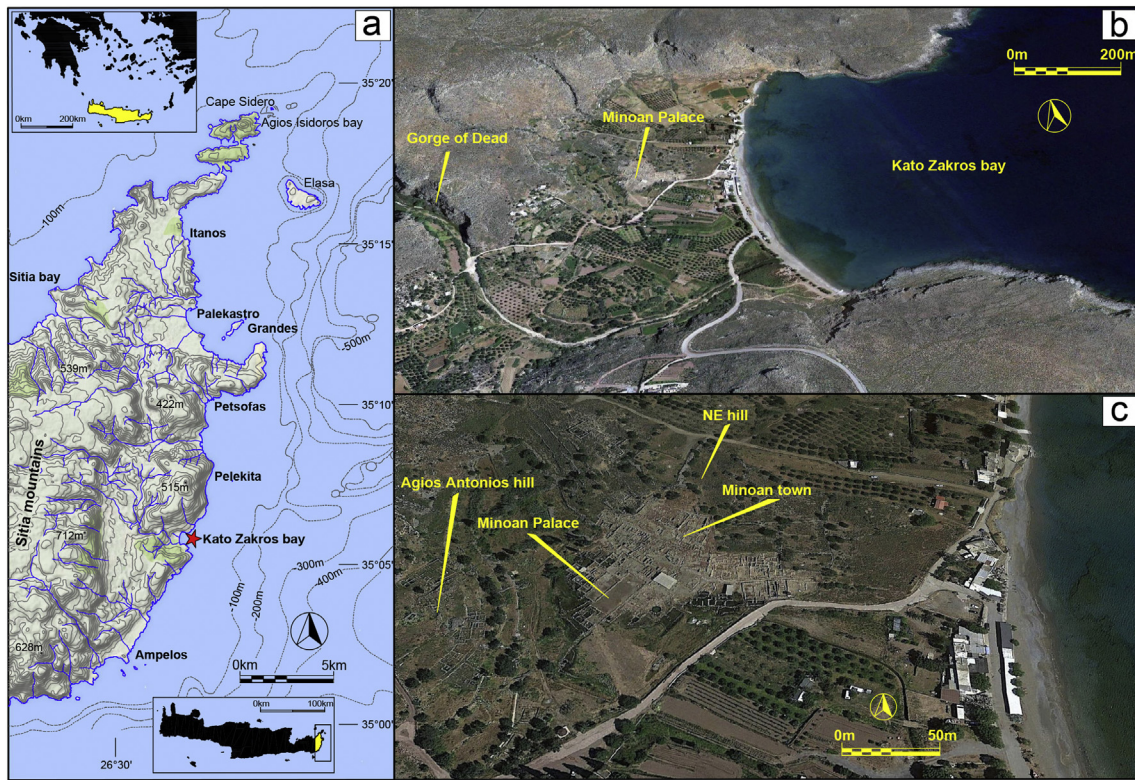


Fig. 1. (a): Location map of the eastern edge of Crete. (b): The bay and the valley of Kato Zakros. (c): The Palace of Kato Zakros between the NE hill and the hill of Agios Antonios to the south, and the relics of the surrounding Minoan town on the hillsides (images from Google Earth).

residential core of the site, being also the boundary between the town and the Palace (N. Platon, 1974) (Fig. 2a).

However, the supposed location of mooring where the harbour road led, today is a steep coast. The extensive sandy-gravelly western coast would offer a shorter, evener and easier access to the Palace and the town (Fig. 1b, 2a). The answer was sought in the submerged palaeomorphology of the coast.

The sea transgression and shoreline alterations evolved together with the successive changes in sea level during the human presence and activity in the area over the last 4000 years. The underwater survey carried out in the present study recorded the submerged landforms and

coastal archaeological constructions related to past sea levels, and after decoding them, the palaeoshoreline was reconstituted, in support of archaeological hypothesis.

2. Historical and archaeological context

The structure of the Minoan Palace of Kato Zakros points to a complex of internal, political, social, economic and religious organization. It was one of the major harbour-towns of the prehistoric antiquity, having trade relations with Asia and Africa, as deduced from large

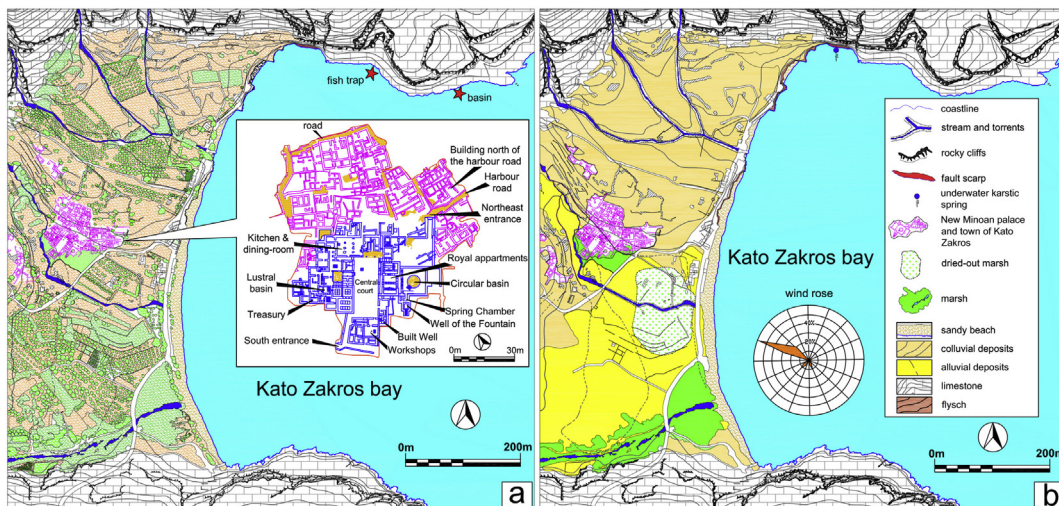


Fig. 2. (a): Location map of the bay and the valley of Kato Zakros. The general plan of the Kato Zakros Palace and the nearby houses of the town (after N. Platon, 1974) are shown in the box. (b): Geological sketch map of Kato Zakros. The wind rose diagram for the Kato Zakros bay is also given.

Download English Version:

<https://daneshyari.com/en/article/5112529>

Download Persian Version:

<https://daneshyari.com/article/5112529>

[Daneshyari.com](https://daneshyari.com)