



The harbour of Elaia: A palynological archive for human environmental interactions during the last 7500 years



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ABSTRACT

Elaia, the harbour city for ancient Pergamon (western Turkey), was investigated using geoarchaeological methods. The rise and fall of Elaia were closely linked to the flourishing period of Pergamon, which ruled wide parts of today's western Turkey in Hellenistic times. In the framework of this research, the palynological analysis of a 9 m sediment core, Ela-70, retrieved from the enclosed harbour of the city, was carried out to reconstruct the vegetation and environmental history of the wider Gulf of Elaia region. An age-depth model, based on 11 calibrated radiocarbon ages, starting from 7.5 ka BP, provides the basis for the high resolution study of sediments from the Hellenistic period, as well as before and after. The lower part of the pollen diagram is characterised by high percentages of deciduous oaks and pines, suggesting the dominance of open forests close to the coring site. The change from oak forests to a cultural landscape, with olive, pistachio, walnut, and grape, started around 850 BC, reaching a maximum ca. 250 BC, and continuing to ca. AD 800. This period is characterised by increase of fire activity, soil erosion intensity, and pastoral farming. Such long-lasting intensive land use likely led to the climax ecosystem turnover from open deciduous oak forests to pine stands, while salt marshes developed around the coring site. The discovery of the dinoflagellate cysts of *Peridinium ponticum*, a Black Sea endemic species, in the harbour of Elaia evidences maritime trade between the Aegean Sea and the Black Sea; its first occurrence coincides with the time of the Mithridatic Wars (1st century BC). In conclusion, palynological data, in addition to historical and archaeological records, provide a deeper insight into human environmental interactions, as derived from the geoarchaeological archive of the harbour of Elaia.

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1. Introduction

Today, the hills of Zeytinadağ (Turkish for olive mountain) and the area surrounding Elaia are covered with olive groves (Fig. 1), playing an important role in the regional economy. Linguistic and numismatic evidence attests to the importance of olive oil

production at Elaia in antiquity. Even the name of the city “Elaia” means “oily” in local Luwian and “olive” in Greek (Pirson, 2004). On the reverse side of coins from Elaia, minted from the 5th/4th century BC until Roman period, olive branches are depicted (Fig. 2b). Elaia has been famous for its olives for centuries, but there are no historical records that bear witness to the onset of olive cultivation.

Archaeological records reveal a continuous occupation of the Elaia region since prehistoric times (Fig. 1b). Ceramics from Elaia indicate settlement activities from the early Bronze Age (Knitter et al., 2013; Pirson, 2007, 2008), while ancient historical accounts provide very little information about Elaia. Strabo (2005) attributes the foundation of the city to Menestheus in the context of the

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Trojan War (Pirson, 2004). Later, Elaia paid the lowest tributes to the Athenian-dominated Delian League (454–425 BC; Pirson, 2004). However, the city gained fame during the period of the Pergamenian Empire (282–133 BC), when it was a naval station for the Pergamenian fleet and was important for military, transport and trade, especially during the flourishing period of Pergamon (Pirson, 2014).

Pergamon, the capital of the Pergamenian Empire, was located on a 330 m high hill on the Kaikos plain at a distance of 26 km to the sea, which provided a perfect defensive position for the city. However, the lack of direct access to the sea restricted traffic and trade. Being the capital city, Pergamon was in need of a harbour, which was constructed in the nearby Elaia (Pirson, 2004). In 133 BC the Pergamenian Empire came under Roman rule (Pirson and

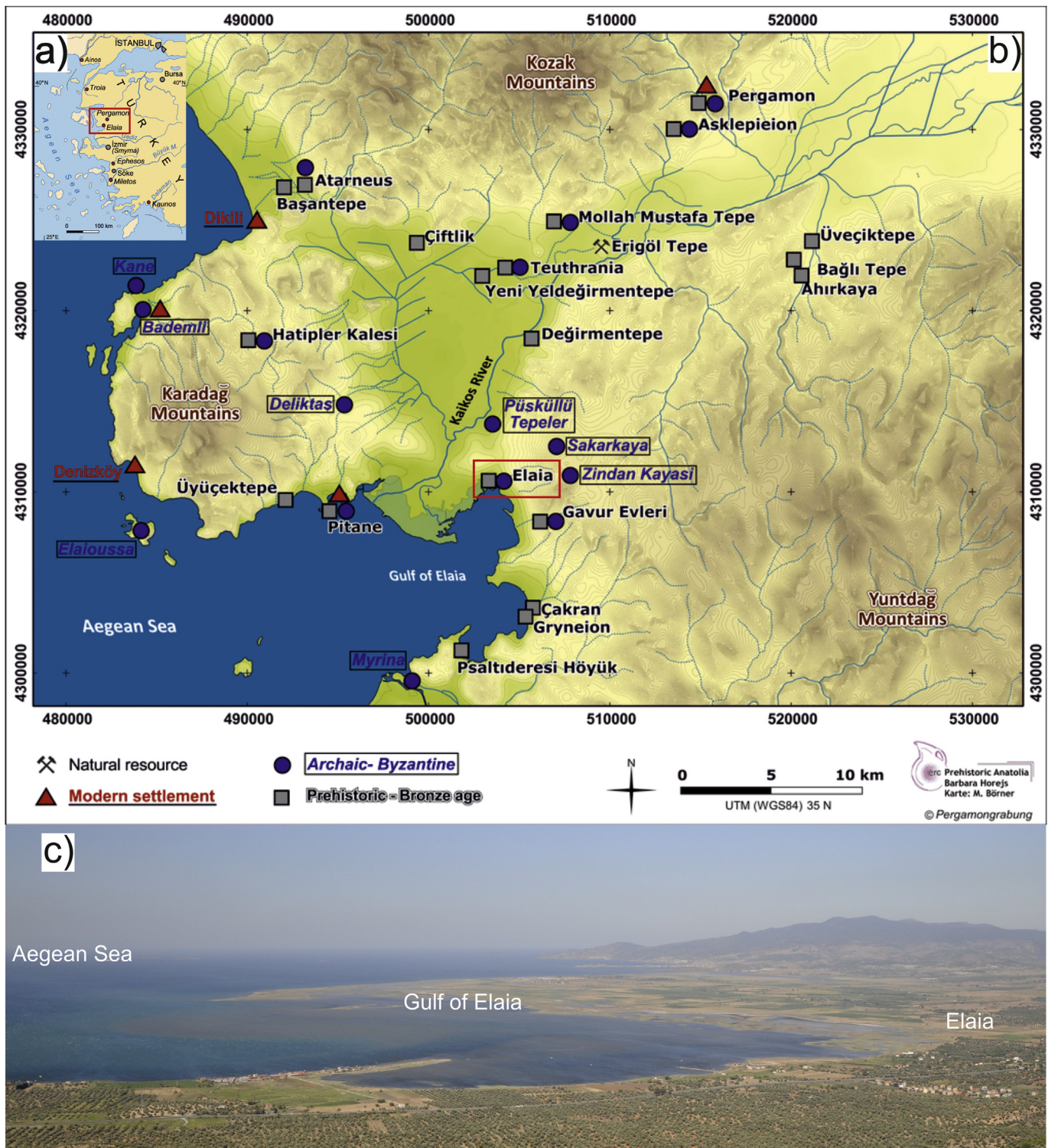


Fig. 1. Location of the ancient city of Elaia: a) Elaia's position in western Anatolia (ancient settlements in italics); b) archaeological sites of the region around Elaia and Pergamon (based on Horjes, 2010); c) view from Yuntdag Mts. on the Gulf of Elaia and olive groves (photo: M. Seeliger, 2010).

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