

**Plio-Quaternary evolution of the Enez Delta, NE
Aegean Sea**

**Kuzeydoğu Ege-Enez Deltası'nın Pliyo-Kuvaterner
gelişimi**

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Abstract

The purpose of this study is to construct the geological evolution of the Enez Delta. The Lower Meriç Delta and its offshore continuation, the Enez Delta, comprise very well developed sedimentary units with abandoned channel mouths, coastal bars and a prodelta lying on the older submarine delta far offshore with steep slopes. In the late Pleistocene, the shelf area over an Upper Miocene basement was flooded during the Riss-Würm interglacial period, exposed in the Würm glacial stage, and reflooded during the Flandrian transgression (Holocene), with each sea-level change characterised by seismic stratigraphic unit. The historical maps together with maps reconstructed on the basis of archaeological data show a rapid infilling of a large bay in the Enez area during the last 3000 years.

Keywords: Enez Delta, Meriç Delta, shallow seismic, seismic stratigraphy

Introduction

The terraces corresponding to the glacial periods resulted in transformation of the continental shelves into land with occurrence of dissections and rejuvenations are generally hidden because of the following transgressions. Submarine valleys and deltas point to such movements and can be explored by seismic methods.

The Meriç Delta Plain is triangular shape with its base placed on the shoreline of Aegean Sea and its apex at the point where the Upper Delta begins and the Meriç River branches into two. The Meriç Delta has developed in a very short time and is growing with two conspicuous lobes on the old submarine delta of the Meriç River (Ardel, 1959), forming a marked feature on the shelf. The seaward part of the Meriç River (Lower Delta) has changed its shape very rapidly as a result of gradually increasing fluvial deposition. This part comprises the area in which still non-filled lagoons and marshes are located. As a result, an almost regular shoreline with lagoons, separated from the sea by slightly inclined bars, later became irregular with the development of progradation forms. Hence, all geomorphologic units representing different stages of development became mixed in this area (Göçmen, 1977).

Systematic archaeological excavations, which were started from 1971, indicated a continuous settlement in the Enez Town of Edirne (Ainos) from BC 5300 (Neolithic Age) (Bağaran, 1996). Neither historical factors such as immigrations and invasions nor natural factors such as river overflows and floods interrupted this settlement. Hence, many historical artefacts representing the Thraces (BC 8-6th centuries), Persian, Hellenistic Period, Roman Empires, Byzantine and Ottoman cultures have been found in the area.

Ainos, with its two harbours, has always kept its historical prominence, since it is placed in a geographic point where main land and sea routes, from the Balkans and Southern Europe to Anatolia and the Aegean Sea, were intersected. It is well known that river transportation was possible along the Meriç River (Eyice, 1956).

The first foundation place of Ainos is 3 km far from the present coastal line and on top of a 25 m height hill. The castle (Akrapol) on top of this hill is belong to the Middle Ages. Some structural relics belonging to the Antiquity (BC 7th century) have been found on this hill. This structure was placed on the hard basement (Miocene limestone) 7.5 m deep from present surface (Erzen, 1974, 1987). Some other relics representing Byzantine and Ottoman periods have also been found on the same hill. However, the Roman period is not so clear. This situation was possibly caused because the Roman material should be used to construct the Byzantine works. On the other hand, on the plain area, the relics of Roman, Byzantine and Ottoman periods are distributed in layers. Archaeological and some drilling works carried out on the Akrapol and the plain area made possible to define two sea levels representing two different historical periods. It is found that +3.5 m contour above present sea level may be acceptable to represent the Byzantine-Ottoman period (from AD 500 to 19th century). On the

other hand, the +7.5 m level is sufficiently good to typify the coastal line for the Prehistoric period (BC 700) when the first structures, those we know today, were constructed. Both of these coastal lines were reconstructed on the same map (Figure 1). The coastal line for the Byzantine-Ottoman periods was about 10 km landwards from the present coast. The hill on which Enez is placed was occasionally turned into an island depending on the floods of the Meriç River. The coastal line during the Archaic period, on the other hand, was about 16 km landwards from the present coast and an island was present in this area.

On the other hand, available real historic maps (in situ) show two branches of Meriç River. The western branch seem to have enlarged forming a sharp point toward the Aegean Sea, whereas its eastern branch discharged into the sea approaching to the northern part of the Gala Lake in the form of a lagoon. According to the map drawn by Piri Reis (Figure 2a), there was an important port at the Enez Town (Piri Reis, 1526). On the Kiepert's map (Figure 2b), the Enez Town is located on the shore of a large lagoon (Kiepert, 1890). This lagoon was separated from the sea by two spits from opposing directions. The mouth of the Meriç River is shown as an obvious protruding part to the north of this lagoon. Maps printed in later dates show rapid dispersal of deltaic deposits in this lagoon (Figure 2c). The estuary shown on the reconstructed map (Figure 1) is now a deltaic plain characterised by backswamp deposits.

The Meriç River discharges its water to the Aegean Sea via two channels at present. One of them belongs to the western branch which is in Greece. The other is the eastern branch which constitutes the political border between Turkey and Greece. Of these two channels, the latter corresponds to the progradation of the present delta. This most recently developed part of the present delta corresponds to the submarine part of Meriç Delta, which hereafter will be called as the Enez Delta. Even though the Enez Delta forms an interesting unit with its old abandoned mouths, coastal bars and sand dunes, it has not been sufficiently dealt with. The structural features such as stratification and lithological differentiation forming the present delta that has evolved partly on the former one are not known in detail due to the lack of geophysical and bore hole data. The main object of this study is to determine the delta's evolutionary phases in Plio-Quaternary. The results discussed in this study concerning the Enez Delta may be the key to the tectonic and geomorphologic evolution of the study area.

Geology

Lower Meriç Valley is located on the southern shelf of the Thrace Basin which is surrounded by the Strandzha massive to the north and Rhodop massive to the west. The sediments deposited between these massifs have been folded in diffe-

