

DEPOSITIONAL SUB-ENVIRONMENTS OF THE EMERGENT SIMETO RIVER DELTA SYSTEM (EASTERN SICILY)

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Abstract

A morphological and sedimentary study conducted in the emerged sector of Simeto delta system has carried out a marked distributions in the sedimentary facies and subfacies, related to presence of artificial levees and embankments, built starting from '50 with the aim to regulate the hydrological regime of the Catania Plain. This strong anthropogenic conditioning of the emerged delta has defined some sub-environments, in which sedimentary processes are today still active and other in which has not been recognised any trace of depositional/erosion activity.

Keywords: Ionian Sea, deltas, sediments.

Our research has been performed in the region of the Simeto River mouth (eastern Sicily). In this area – about 10 km² in extension – the study focuses on sedimentary facies as related to emergent depositional sub-environments (Fig. 1).

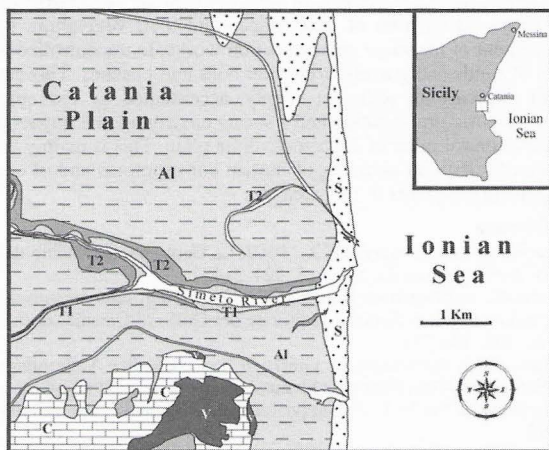


Fig. 1 Geolithological map of investigated area

A1 = alluvial sands and silts. S = marine sands. T1 and T2 = fluvial terraces of 1st and 2nd order respectively. C = calcarenites. V = volcanites.

The Simeto River, 115 km long, has an drainage basin of 4.185 km². It is the most important river of Sicily, its emergent delta dips into the Ionian Sea and it is characterised by well-defined depositional sub-environments, with marine to fluvial facies.

The emergent beach (zones of backshore and foreshore) is characterised by marine facies, with sandy sediments rich in bioclasts (facies A1 and A2). Some beachrocks (facies B) and dunes (facies C) of various extension are present as well.

Our study method has consisted in a historic cartographic analysis of the delta, aimed to define the morphologic variations that happened in the last 50 years.

In a second stage samples has been collected in the study area in order to define the textural characters of the sediments. Finally the main morphologic units has described on thematic maps.

In the innermost zone (backshore) the mapped fluvial facies are well zoned due to the artificial levees that have built in the '50, for controlling the surficial hydric discharge in the Catania Plain.

The depositional sequence is made of 2 orders of terraced fluvial deposits (facies D1 and D2). The most recent are made of flood sediments (facies E), the oldest (facies F) are made of sediments deposited outside of artificial levees and therefore associated to antecedent fluvial processes.

The study of the depositional sub-environments that characterise the emergent delta has been associated with the analysis of sediments aimed to distinguish the major morphologic units and the subfacies of the emerged system of the Simeto River (Fig. 2).

According to recent classifications in deltas (2; 3), we may distinguish:

- lower delta plain facies association. This is the area most influenced by the nearby sea where coastal swamps and abandoned meander lagoons are present;

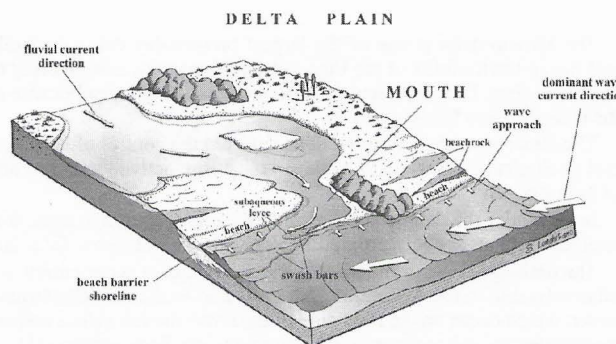


Fig. 2. 3D model of the area of the Simeto river mouth

- upper delta plain facies association. This is the internal most area of the drainage basin, including the internal stream water in which sedimentary processes are rare.

If we take into account the peculiar morphologic features of the Simeto River in its mouth we may also distinguish additional facies associations:

- inner delta plain facies, inside the artificial levees where the major fluvial sedimentation occurs;
- outer delta plain facies, external to the levees, where sedimentary processes are relatively scarce or absent.

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