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## SEDIMENTOLOGICAL AND MORPHOLOGICAL EVOLUTION OF THE CRATI RIVER DELTA (CALABRIA, ITALY)

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The Crati River is the main river in Calabria. Its lower part runs through the plain of Sibari, and flows into the Ionian Sea where it builds a cusped delta. Features and evolution of the emerged delta are inferred, over the last 3000 years, from historic and archaeological data going back to the foundation of Sibari. Infilled lagoons and beach-ridges mark the delta progradation.

Medium-coarse sand forms the beaches, medium-fine one develops the dunes, while sandy mud dominates the inner areas as the product of repeated floods. Mud prevails in the palaeochannels. Sandy and gravelly bodies packed in pelitic sediments showing depositional regression make the Pleistocene-Holocene sedimentary facies sequence. Delta front and upper prodelta are not well developed. A part of sediments bypasses and feeds the deep-sea basin through canyons headed near the river mouth.

KEY WORDS: Delta, Postglacial evolution, Crati River, Italy.

### GENERAL OUTLINES

The Crati River, with its length of nearly 90 km and a drainage basin covering about 2,500 km<sup>2</sup>, is the major stream of Calabria. It drains mainly the Sila massif (to the East and to the South), the Catena Costiera Tirrenica (to the West) and, through the Coscile River its most important tributary, the Pollino massif (to the North). The final stretch of its course winds through the Sibari plain where the present Crati delta develops (fig. 1).

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The fluvial regime of the Crati River is one of the typical streams of southern Italy and reflects the pluviometric regime of Mediterranean climates. Average monthly discharges, during January and February, exceed 50 m<sup>3</sup>/s and are below 10 m<sup>3</sup>/s during summer (July). The average monthly value of the suspended load ranges from 0.37 kg/m<sup>3</sup> (June) to 2.10 kg/m<sup>3</sup> (October); however this value is very changeable with peaks exceeding 30 kg/m<sup>3</sup> (recorded during the June-October period) originating hyperpychnal flows at the mouth.

The drainage basin of the Crati River is placed in the northern end of the Calabrian Arc where the subduction of the Ionian Sea bottom takes place; its evolution is highly controlled by several phases of tensional tectonics and by strike-slip faults developed mainly during Pliocene, but still active (Tortorici, 1980; Lanzafame & Tortorici, 1980).

Both the Sibari Plain and the facing basin are highly affected by transcurrent tectonic lines E-W and NW-SE oriented. Moreover, the plain is also subject to a general subsidence with average rates, calculated for the last 2,700 years, being close to 3.0 mm/yr, but locally touching even 4.4 mm/yr. The subsidence is partly ascribed to tectonics of this area and partly to the load of recent sediments (Guerricchio & Ronconi, 1997). Materials, products of the erosion of crystalline and partly ophiolitic rocks of the Sila massif, characterize the composition of the Crati River sediments, which only subordinately are formed by carbonate rocks coming from the Pollino massif. Sediments of the Crati River are the most important components of the Sibari Plain which developed mainly during Pleistocene; today these sediments are partly distributed by the littoral drift along the coast (Bellotti & alii, in press) and partly forwarded to the deep basin facing the river mouth (Ricci Lucchi & alii, 1984) by density currents originating when the solid river load reaches values giving rise at the mouth to hyperpychnal flows.