

BIOTIC, MINERALOGICAL, PETROGRAPHIC, AND GEOMORPHOLOGICAL CHARACTERIZATION OF THE FALERNO-DOMITIO SHORELINE (CAMPANIA REGION, SOUTHERN ITALY), WITH IMPLICATION FOR ENVIRONMENTAL HEALTH STUDIES: PRELIMINARY RESULTS

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GEOLOGICAL FRAME & RESEARCH AIMS

We report the first results of a study in progress related to the project FARO (i.e. the Italian "Fund for original research projects", granted by the Università di Napoli Federico II and IMI bank partner). This research project aims to the enhancement of the physical and biotic features of the coastland and waterscape of the Falerno-Domitio shoreline, located in the mid-northern sector of the Campania region (southern Italy), from the Garigliano river and Torregaveta promontory. Similar studies have been also done in other worldwide areas (i.e. Armstrong-Altrin *et al.*, 2012). In the national scenario, this area can be considered as a valuable "natural laboratory", for its wildlife (i.e. the "Foce Volturno" natural reserve, the "Campi Flegrei" regional park, etc.), famous archaeological sites (e.g. Cuma excavations), and peculiar geological and volcanological characteristics of the volcanic area of Phlegraean Fields.

Unfortunately, this area also suffers for a strong pollution and environmental degradation due to human activities.



METHODS OF STUDY

The research consists of a multidisciplinary analysis, based on a bathymetric sensing, sampling of both the sea bottom sediments and the beach deposits. It comprises:

- 1) integrated monitoring of the quality of environmental health through a biological study,
- 2) geomorphological and sedimentological and morphoscopic analyses of the area and of the whole sample sets, with GIS data processing,
- 3) taxonomic and ecological analyses of selected benthic meiofauna assemblages,
- 4) mineralogy, petrography and geochemistry of beach sands along the shoreline, as well as of sea bottom samples.



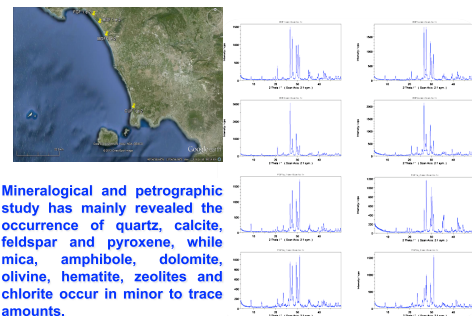
Domitio shoreline, Licola (photo by C. Donadio)



Torregaveta submarine cliff, -3.5 m (photo by C. Donadio)

RESULTS

Up to now, sampling of the beach sands has been carried out starting from the Garigliano River mouth up to the Cuma site (Garigliano, Baia Domizia, Mondragone, Cuma purification plant). Mineralogical and petrographic characterization was obtained by XRD and stereoscopic/optical microscopy.



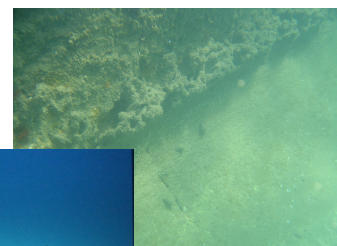
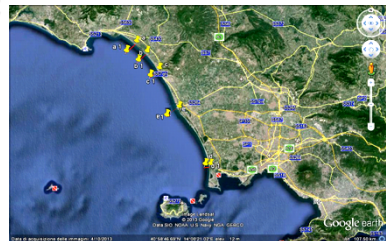
Mineralogical and petrographic study has mainly revealed the occurrence of quartz, calcite, feldspar and pyroxene, while mica, amphibole, dolomite, olivine, hematite, zeolites and chlorite occur in minor to trace amounts.



Ecologic and eco-toxicologic studies on selected samples are also carried out, showing the structure of meiofauna (benthic foraminifera and ostracods) assemblages. Tests on the occurrence of the bio-indicator organism *Artemia salina* are also performed and, demonstrating a relatively low toxicity of the samples analyzed up to now.

Sample	# immob.	% immob.	Locality	Depth
Blank	R1	10%		
	R2			
MDF1	R1	0%	Strada Statale 7 Quiliter Domitiana, 81037 Baia Azzurra-levagnole CE	surface level
	R2			
MDF1a	R1	0%	Strada Statale 7 Quiliter Domitiana, 81037 Baia Azzurra-levagnole CE	- 50 cm
	R2			
MDF2	R1	0%	Strada Statale 7 Quiliter Domitiana, 81037 Baia Azzurra-levagnole CE	surface level
	R2			
MDF2a	R1	0%	Strada Statale 7 Quiliter Domitiana, 81037 Baia Azzurra-levagnole CE	- 50 cm
	R2			
CUF1	R1	0%	Strada Provinciale Cuma Licola, 80078 Pozzuoli NA	surface level
	R2			
CUF1a	R1	0%	Strada Provinciale Cuma Licola, 80078 Pozzuoli NA	- 50 cm
	R2			
CUF2	R1	5%	Strada Provinciale Cuma Licola, 80078 Pozzuoli NA	surface level
	R2			
CUF2a	R1	5%	Strada Provinciale Cuma Licola, 80078 Pozzuoli NA	- 50 cm
	R2			
BDF1	R1	0%	Viale dei Pini, 2, 81037 Baia Domizia CE	surface level
	R2			
BDF1a	R1	0%	Viale dei Pini, 2, 81037 Baia Domizia CE	- 50 cm
	R2			
BDF2	R1	0%	Viale dei Pini, 2, 81037 Baia Domizia CE	surface level
	R2			
BDF2a	R1	0%	Viale dei Pini, 2, 81037 Baia Domizia CE	- 50 cm
	R2			
FGF1	R1	0%	SS7, 81037 Sessa Aurunca CE	surface level
	R2			
FGF1a	R1	0%	SS7, 81037 Sessa Aurunca CE	- 50 cm
	R2			
FGF2	R1	5%	SS7, 81037 Sessa Aurunca CE	surface level
	R2			
FGF2a	R1	0%	SS7, 81037 Sessa Aurunca CE	- 50 cm
	R2			

Mapping of the sea bottom and related sediment sampling across five cost-to-offshore transects selected along the Falerno-Domitio shoreline are still ongoing. Many aspects are investigated for the first time in the study area.



REFERENCES

Armstrong-Altrin J.S., Lee Y. II, Kasper-Zubillaga J. J., Carranza-Edwards A., Garcia D., Eby N. G., Balaran V., Cruz-Ortiz N. L. (2012) - Geochemistry of beach sands along the western Gulf of Mexico, Mexico: Implication for provenance. *Chemie der Erde - Geochemistry*, 72/4, 345-362.

F.A.R.O. Project Team (2012-2013) Analisi delle componenti fisico-biotiche, minero-petrografiche e morfosedimentarie per la definizione della qualità igienico-ambientale del Litorale Falerno-Domitio (Campania). Granted research University of Naples Federico II-San Paolo IMI Bank.