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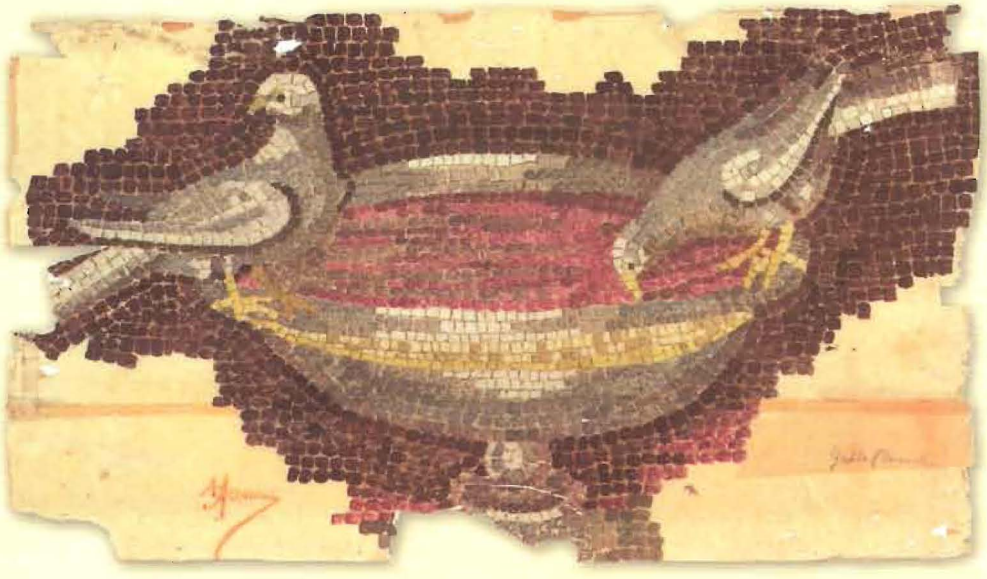
(ChemCH)



Ravenna, 30th June - 3rd July 2010

BOOK OF ABSTRACTS

ORAL SESSION 1:
TRANSFORMATION ON HERITAGE SURFACES

S1O17

DAMAGE OF CALCARENITE STONE IN ARCHAEOLOGICAL SITE: RELATIONSHIPS BEETWEEN WEATHERING, POLLUTION AND BIOLOGICAL AGENTS

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For thousand of years, when magnificence and beauty were the goals of architecture, stones were the most widely used durable materials. The deterioration of building stones causes irreparable damages to our cultural heritage, not only as loss of architecture and ancient art, but especially as loss of symbols of human cultural identity and continuity. Sun, frost, wind, rain, pollution etc. contribute to a gradual process of weathering. Biological activity also plays a role and its association with physico-chemical phenomena should be considered essential for understanding long term deterioration.
The artistic heritage of Apulia region provides a striking example of the undisputed importance of Greek and Roman architecture in the Mediterranean basin. The litho types used for buildings are mostly calcarenite of clastic origin characterized by a high percentage of calcium carbonate, which is most sensitive to chemical, physical and biological agents.
As the biological agents (musk, algae and lichen species, in particular) cause bio erosion processes in carbonated substrates, it would appear necessary to understand the weight of each single environmental parameter in order to assess and to plan not only a suitable restoration project and a preventive maintenance but also to test natural products (biocides) against degradation caused by bio deterioration agents. We studied the influence of climatic parameters and their relationships with biological attacks on a building placed in the archaeological site of Lavello, a little town located in the Basilicata Region. X-ray diffraction, X-ray induced photoelectron spectroscopy (XPS), X-ray fluorescence spectrometry (XRF) and Fourier

Transform Infrared spectroscopy (FT-IR) were carried out on powdered calcarenite samples. Preliminary results show that climatic parameters (temperature, light irradiation, wind and humidity) undermine the structure and the compactness of stones (i.e. micro-fractures, increase of salts' concentration) favouring the biological colonization.