



Catania, 12-14 settembre 2018

ABSTRACT BOOK

a cura della Società Geologica Italiana

Congresso congiunto
SGI-SIMP



CATANIA-2018
12-14 SETTEMBRE



CONGRESSO
SGI · SIMP

«Geosciences for the environment,
natural hazards and cultural heritage»

PRESIDENTI DEL CONGRESSO:

Carmelo Monaco (SGI) e Paolo Mazzoleni (SIMP).

COMITATO SCIENTIFICO:

Valerio Agnesi, Domenico Calcaterra, Angelo Camerlenghi, Piergiulio Cappelletti, Stefano Catalano, Massimo Coltorti, Claudio Faccenna, Sandro Conticelli, Agata Di Stefano, Elisabetta Erba, Stefano Gresta, Alessio Langella, Alessandro Pavese, Mauro Prencipe, Marco Viccaro.

COMITATO ORGANIZZATORE

Rosolino Cirrincione (coordinatore), Germana Barone, Stefano Branca, Giovanni Barreca, Bernardo Carmina, Salvatore Caffo, Carlo Cassaniti, Domenico Cosentino, Giorgio De Guidi, Lorenza Fascio, Eugenio Fazio, Carmelo Ferlito, Patrizia Fiannacca, Nadia Malaspina, Rosanna Maniscalco, Gaetano Ortolano, Giovanna Pappalardo, Fabio Massimo Petti, Rosalda Punturo, Rossana Sanfilippo, Giuseppe Tortorici, Alessandro Zuccari.

CURATORI DEL VOLUME

Fabio Massimo Petti, Bernardo Carmina, Rosolino Cirrincione, Carmelo Monaco.

*Papers, data, figures, maps and any other material published are covered by the copyright own by the **Società Geologica Italiana**.*

DISCLAIMER: The Società Geologica Italiana, the Editors are not responsible for the ideas, opinions, and contents of the papers published; the authors of each paper are responsible for the ideas opinions and contents published.

La Società Geologica Italiana, i curatori scientifici non sono responsabili delle opinioni espresse e delle affermazioni pubblicate negli articoli: l'autore/i è/sono il/i sol/i responsabile/i.

PLATINUM SPONSORS



GOLD SPONSORS



SILVER SPONSORS



BRONZE SPONSORS



ABSTRACT INDEX

Plenary lectures	1
Session S1. Biota evolution, biomineralization and responses of ecosystems to environmental perturbations: from local to global, from short- to long-term.....	6
Session S2. Deciphering ancient paleoenvironmental perturbations and their impact on the marine ecosystems.....	22
Session S3. Marine geohazards on the continental margins of Italy	49
Session S4. The role of Italian scientists and educators in the International Ocean and Continental Drilling Programs: major achievements and new perspective.....	64
Session S5. Onshore and offshore Quaternary sedimentary processes and sequences in the Mediterranean regions	80
Session S6. The dynamics of sedimentary processes in coastal areas.....	92
Session S7. From analogue to digital geological mapping: opportunities and risks in the use of new tools	103
Session S8. Tectonic and sedimentation relationships in Mediterranean basins and belts. A tribute to Fabio Lentini.....	130
Session S9. Faulting and folding across the scales. How, where, and why the lithosphere deforms	161
Session S10. The role of shear zones in the tectono-metamorphic evolution of the lithosphere: insights from microfabric to mountain belt structures.....	181
Session S11. Tectono-metamorphic processes from micro-scale to plate margins: Geological, Geophysical and Petrological approaches in unravelling the evolution of metamorphic terrains in collisional belts.	210
Session S12. Georesources and Energy for the XXI Century.....	238
Session S13. Outcrop analogues in exploration and production.....	269
Session S14. Integrated studies of recent and active deformations onland and offshore	280
Session S15. Tectonic and geodynamic control on large earthquakes and complex earthquake sequences: case studies from Italy and not only.....	301
Session S16. Mediterranean subduction zones: from deep mantle to shallow structure and volcanism.....	325
Session S17. Geodynamic evolution between the Variscan and Alpine orogeneses: clues from mantle features and magmatic events	342
Session S18. The nature of the crust-mantle transition and its effects on the regional tectonic and magmatic evolution.....	355
Session S19. Melt/fluid-rock interaction and migration from the mantle to the surface.....	370
Session S20. Magma genesis and transport	405
Session S21. Linking deep and surface processes: advances in volcanology from a multidisciplinary perspective.....	435

Session S22. Volcano Hazard Monitoring	456
Session S23. Minerals at non-ambient conditions: A Snapshot of the Earth and other planetary bodies.....	467
Session S24. Geomaterials: Nature, properties and technology	490
Session S25. Puzzle crystallography of inorganic structures. A tribute to Fiorenzo Mazzi	509
Session S26. Zeolites and porous materials: Unravelling the relations between crystal-chemistry, stability, structure and properties	522
Session S27. Environmental and medical mineralogy: from molecular to macro scale processes	535
Session S28. Mineralogy, waste management and environmental pollution.....	549
Session S29. Environmental pollution related to Naturally Occurring Asbestos (NOA) in serpentinites and other geo-matrices	570
Session S30. Geosciences for Cultural Heritage.....	592
Session S31. Mining sites: from industrial heritage to cultural heritage	642
Session S32. Cave and karst studies: from ancient to modern processes	658
Session S33. The contribute of Hydrogeology and Geochemistry in the study and management of the water resources	679
Session S34. Monitoring of deformation of structures and ground surface displacements.....	708
Session S35. Landslides: monitoring, hazard and impact on society and cultural heritage	724
Session S36. Landscape and Landforms: geoheritage in urban and natural areas.....	738
Session S37. Geoparks and geosites: tools for knowledge and protection of geological heritage	756
Session S38. History of geosciences and Geoethics: the right way for social responsibility.....	774
Session S39. Fifty years after the Belice's Earthquake. Considerations on geological, geophysical, geochemical, territorial and social aspects of this earthquake and its heritage in the connections between the Italian society and seismic catastrophes.....	790
Session S40. The role of abiotic and biotic soil components, environmental materials and factors, and physical evidence in criminal investigations, environmental crimes, and legal system.....	805
Session S41. Planetary evolution: insights from geological studies, meteorite analyses and terrestrial analogues	820
Session S42. Geosciences at school 2018: geoscience and society	845
Authors' index.....	880

Degradation of mortars containing aggregate rich in serpentinites: the case of industrial brick masonry

Rizzo M.^{*1}, Sardella A.², Bonazza A.² & Vaccaro C.¹

¹ Department of Physics and Earth Sciences - University of Ferrara

² ISAC-CNR - Institute of Atmospheric Sciences and Climate, Bologna

* *Corresponding email:* vcr@unife.it

Keywords: asbestos, light-weight masonry mortars, decay of mortars

The risk of asbestos exposure (European Directive 1999/3/CE) is generally assessed for the C&D waste (Construction and Demolition), for the asbestos cement (eternit) used as building materials (plates, pipes, floor) and for the asbestos textile used for thermal insulation in the industrial sectors and in fire protection barriers. The evaluation of risk for dispersion of asbestos fibres in the atmosphere due to degradation of lime mortar containing aggregate rich in serpentinite is rarely analysed.

The aggregate containing fibrous minerals in light-weight masonry mortars was used in the industrial building of '900 to reduce the average density and thermal conductivity and to increase the physico-mechanical. The big development of constructions in the 20th century promoted the experimentation of innovative solutions to improve the performance of industrial buildings and in particular the industrial brick masonry chimneys and furnaces.

The use of sand rich in fibrous minerals is one of these innovative technological solutions. It was adopted in the beginning of the 20th century to realize the sugar factory that it was in use until 1968 and that is now the Technological Scientific Pole of University of Ferrara. That sugar factory is a symbol of the industrial history of the Po River Plain, so it is protected by the Italian Ministry of Cultural Heritage (Minghini et al., 2016).

As a result of the petrographic study of the mortars, they were classified as a mixture of lime and cement and an aggregate consisting of silicate sandstones, carbonate and fragments of ophiolite rocks (tholeiitic basalts and serpentinites). Considering the composition of the rocks and the geographic location of the sugar factory, it is possible that the sand was extracted in the Sillaro River area (Benini & Guasti, 1992).

The use of sand rich in fibrous minerals precedes the introduction of the filler and of the asbestos textile in the cements and mortars to improve their technological performance. The study of mortars has shown their high propensity to crack due to salt crystallization, frost stress and biological degradation, so the mortar durability is lower when they are deprived of the protective layer of the plaster.

Minghini, F., Bertolesi, E., Del Grosso, A., Milani, G. & Tralli, A. (2016): Modal pushover and response history analyses of a masonry chimney before and after shortening *Engineering Structures*, 110, 307-324.

Benini, A. & Guasti, M. (1992): Carta geologica dell'Appennino emiliano-romagnolo. Sezioni n. 238060 "S. Clemente", 238090 "Bisano", 238130 "Frassineto". Regione Emilia-Romagna, ufficio Cartografico. S.EL.CA., Firenze.