

Interactive comment on “PM₁ geochemical and mineralogical characterization using SEM-EDX to identify particle origin – Agri Valley pilot area (Basilicata, Southern Italy)” by S. Margiotta et al.

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Dear Editor,

On the behalf of my co-authors, I would like to thank you and the Referee for the suggestions aimed at improving the proposed study. Following the suggestions, we have revised the manuscript. We hope that the manuscript in its revised version will meet your approval and that it will be accepted for publication in the Natural Hazards and Earth System Sciences journal. Thank you in advance for your attention.

Kind regards

C797

NATURAL HAZARDS AND EARTH SYSTEM SCIENCES - MANUSCRIPT NHES-2014-140

PM1 GEOCHEMICAL AND MINERALOGICAL CHARACTERIZATION USING SEM-EDX TO IDENTIFY PARTICLE ORIGIN – AGRY VALLEY PILOT AREA (BASILICATA – SOUTHERN ITALY)

Authors' Response To Editor's and Reviewer's Comments

ANONYMOUS REFEREE # 2

Replies to the general comments

1. In the title, you write “PM₁ geochemical...”, however in the text you don't report geochemical data and you don't make a significant discussion on it. In the present form the title isn't conform to contents. I strongly suggest to change “geochemical” with “chemical”.

Reply: We used the term “geochemical” because chemical analysis shows that most of the coarser fraction (> 0.7 μm) particles are geogenic, providing data to define the relative mineralogical phase in order to obtain characteristic ratios (such as Al/Si) and to compare its composition with the Saharan soils geochemical characters as indicated in literature. Hence we believe that the title conforms with the content of the manuscript.

2. I think a few data about geological framework have to be added in the Pilot Site section.

Reply: We accept the referee suggestion and added some information about geological framework of the area studied in the Pilot Site section.

Changes to be made to the manuscript:

Page 294 Line 10 (after “Taranto”). To be added: “From a geological point of view, the area is characterized by a wide range of the lithotypes represented, with variable compositional characters. The mountain ridges of the Agri Valley are mainly composed

C798

of white and grey limestone and subordinately dolostone of the Apenninic Carbonate Platform, tectonically overlapped upon radiolarites, siliceous argillites, calcilutites and marls referable to the Scisti Silicei Formation and Galestri Formation of the Lagonegro Units (Scandone, 1971; Carbone et al., 1988, 1991; Pescatore et al., 1999). The area north of the Pietra del Pertusillo Lake, at orographic left of the Agri River, is also characterized by the Albidona Formation (marls, clayey marls and silty clays) and Gorgoglione Flysch (sandstones and clays) terrains (Selli, 1962; Lentini et al., 1987; Carbone et al., 1991). The Agri valley is filled with continental clastic Quaternary units represented by coarse-grained slope deposits and clastic deposits from alluvial and lacustrine environment (Di Niro and Giano, 1995; Giano et al., 2000; Zembo, 2010; Giano, 2011; Gueguen et al., 2015).”

To be added in References following papers:

Scandone, P.: Note Illustrative della Carta Geologica d'Italia alla scala 1: 100.000, Fogli 199, 210, Potenza e Lauria, Servizio Geologico d'Italia, 1971.

Pescatore, T., Renda P., and Tramutoli, M.: Carta geologica della Lucania centrale (Appennino meridionale), Regione Basilicata, Potenza, 1999.

Carbone, S., Catalano, S., Lentini, F., and Monaco, C.: Le unita' stratigrafico-strutturali dell'Alta Val d'Agri (Appennino Lucano) nel quadro dell'evoluzione del sistema catena-avanfossa, *Memorie della Società Geologica Italiana*, 41, 331-341, 1988.

Carbone, S., Catalano, S., Lazzari, S., Lentini, F., and Monaco, C.: Presentazione della carta geologica del Bacino del Fiume Agri (Basilicata), *Mem. Soc. Geol. It.*, 47, 129-143, 1991.

Selli, R.: Il Paleogene nel quadro della geologia dell'Italia meridionale, *Memorie della Società Geologica Italiana*, 3 (7), 1962.

Lentini, F., Carbone, S., Catalano, S., and Monaco, C.: Confronti sedimentologico-petrografici e posizione strutturale dei Flysch di Albidona e di Gorgoglione nella media

C799

Val d'Agri (Appennino lucano). *Memorie della Società Geologica Italiana*, 38, 259-273, 1987.

Di Niro, A. and Giano, S. I.: Evoluzione geomorfologica del bordo orientale dell'Alta Val d'Agri (Basilicata), *Studi Geologici Camerti, Special Issue*, 2, 207–218, 1995.

Giano, S. I., Maschio, L., Alessio, M., Ferranti, L., Improta, S., and Schiattarella, M.: Radiocarbon dating of active faulting in the Agri high valley, southern Italy, *J. Geodynam.*, 29, 371–386, doi:10.1016/S0264-3707(99)00058-7, 2000.

Zembo, I.: Stratigraphic architecture and quaternary evolution of the Val d'Agri intermontane 20 basin (Southern Apennines, Italy), *Sediment. Geol.*, 223, 206–234, 2010.

Giano, S. I.: Quaternary alluvial fan systems of the Agri intermontane basin (southern Italy): tectonic and climatic control, *Geol. Carpath.*, 62, 65–76, 2011.

Gueguen, E., Bentivenga, M., Colaiacovo, R., Margiotta, S., Summa, V., Adurno, I.: The Verdesca landslide in the Agri Valley (Basilicata, southern Italy): a new geological and geomorphological framework, *Nat. Hazards Earth Syst. Sci. Discuss.*, 3, 1971-2001, doi:10.5194/nhessd-3-1971-2015, 2015.

3 In this paper, wide importance was attributed to coarser fraction of the samples skipping the finer one. However the author claim: “. . . the finer particles consist mainly of anthropogenic or composite origin aerosol. . .”. In order to improve the reasoning, it could be better including discussion on the finer fraction.

Reply: The coarser ($\geq 0.7 \mu\text{m}$) and finer ($< 0.7 \mu\text{m}$) fractions show very different compositional characters with respect to the distribution of natural and anthropogenic components. The coarser fraction is discussed in greater detail because geogenic particles are concentrated mainly in the $\geq 0.7 \mu\text{m}$ fraction, which an important aspect of this research. Furthermore, the analytical technique used provided very weak signals for the finer particles, characterized by a low Z.

4. Figure 2. The reference are missing, please indicate it.

C800

Reply: the reference is missing because the meteorological data is not published but is provided directly by Viggiano Civil Protection, also mentioned in the acknowledgments.

5. Figures 5-6-7-8. You should insert the date of burning torch ĩĆare event.

Reply: We accepted the referee suggestion and added to figures 5-6-7-8 the indications of the flare event date.

Changes to be made to the manuscript: Please replace the old figures 5-6-7-8 with the new versions attached, and edit relative captions by adding the phrase "the flare event date is highlighted in red".

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 291, 2015.

C801

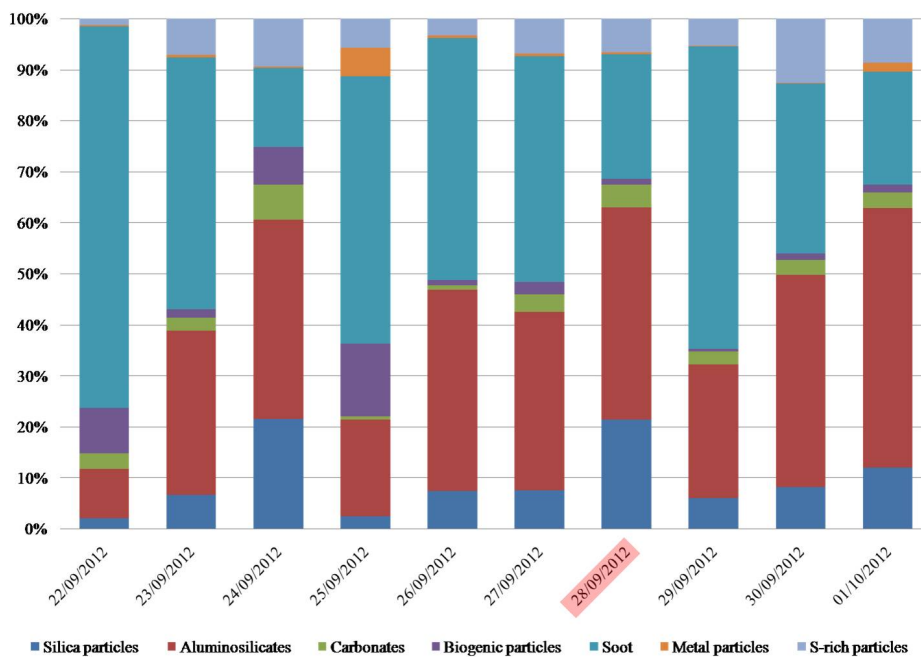


Fig. 1. Figure 5

C802

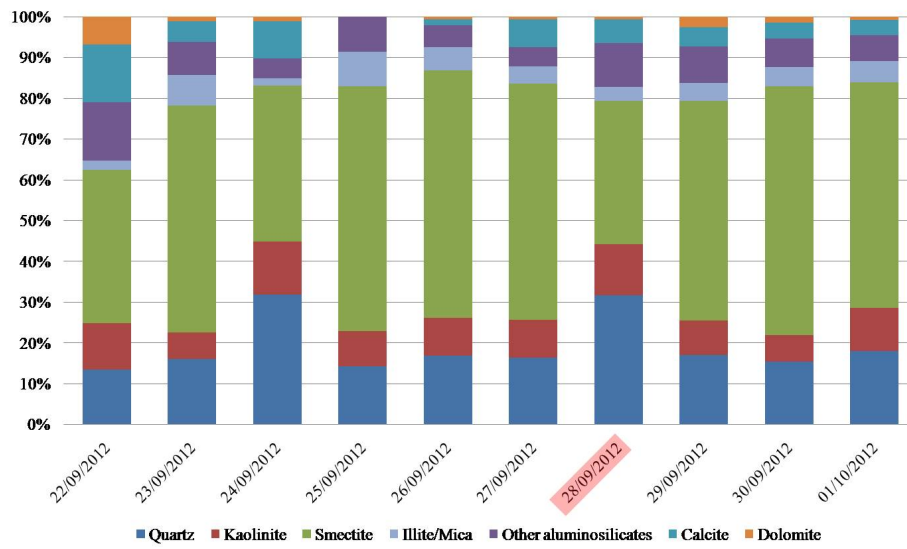


Fig. 2. Figure 6

C803

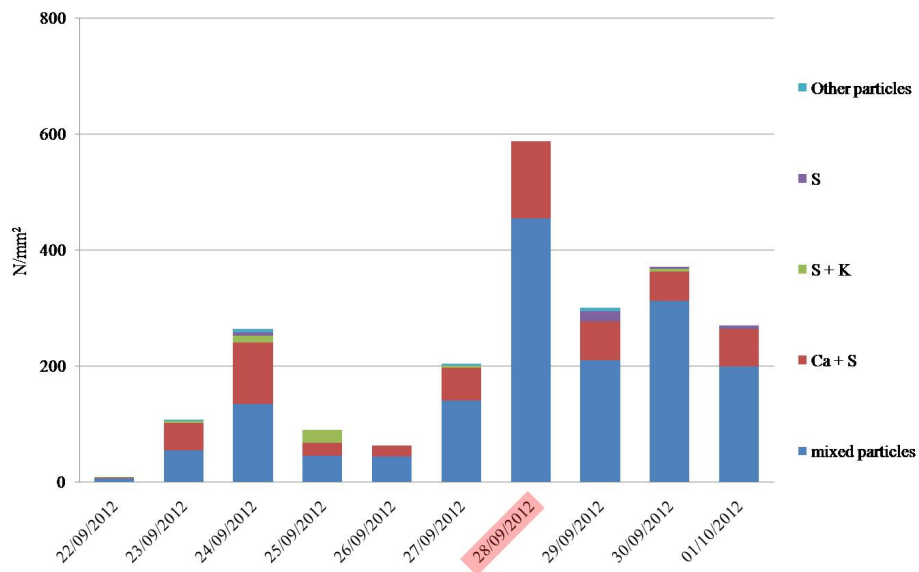


Fig. 3. Figure 7

C804

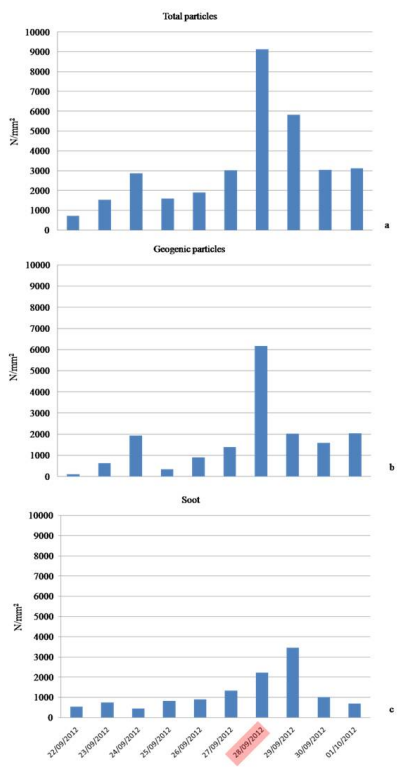


Fig. 4. Figure 8

C805