International Journal of Earth Sciences

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--Manuscript Draft--

Manuscript Number:	IJES-D-18-00416
Full Title:	A ghost eruption behind ‘‘Le vulcanoclastiti di Craco’’ ghost town, Basilicata, Italy
Article Type:	GeoSites
Keywords:	"Le vulcanoclastiti di Craco"; Basilicata Region; Craco ghost town; ash turbiditic deposits; geosite
Abstract:	

A ghost eruption behind ‘‘Le vulcanoclastiti di Craco’’ ghost town, Basilicata, Italy

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TEXT

What a perfect location to detect a ghost eruption around a ghost town! A ghost eruption is generally explosive and is defined here as *an eruption of which one may know the provenance, the age and perhaps the geodynamic context, but may not know the exact eruptive event generating associated deposits*. ‘‘Le vulcanoclastiti di Craco’’ are volcaniclastic levels cropping out around Craco (40° 23' N, 16° 26' E) (Doronzo 2005) which is known, among a number of cinematographic reasons (e.g., Mel Gibson’s action), to be a ghost town. The town stands on a hill ~400 m high immersed in the landscape of ‘‘calanchi’’, which are badlands typical ~~in~~ Basilicata region, Italy (Sabato et al. 2018) (Fig. 1). It is a ghost town ~~because of~~ a landslide occurred in 1963; the landslide heavily impacted the edifices, then the ~~population~~ moved to the feet of the hill in Craco Peschiera locality where now live (Fig. 2).

According to The Icelandic Institute of Natural History (year 2017), ‘‘*geosites are formations that in one way or another are special or distinguishable from other similar formations, due to age, chemical composition etc*’’. Hence, ‘‘Le vulcanoclastiti di Craco’’

are described here as a geosite due to ‘‘*diversity and rarity, size, contiguity and relation to formation, visual value and beauty*’’ and also to ‘‘*international importance, e.g., information value, scientific and research value*’’, among other cultural and geomorphological values. By taking the SP176 road from Pisticci town to Craco Peschiera, then the SP103 road after a few kilometers to the right, one can enjoy Craco and the hill on the right side while observing ‘‘Le vulcanoclastiti di Craco’’ all around.

These are whitish, meters-thick volcaniclastic levels which are distinguishable as intercalated within clays ~~of~~ the second Pliocene cycle (Bentivenga et al. 2005) (Fig. 1). In particular, they are distinguishable in Masseria Galante, Fosso Bruscata and Masseria Fornella localities; in the latter, the levels are darker (Doronzo 2005). The sedimentological features, petrology and geochronology of the volcaniclastic levels are described in detail by Prosser et al. (2008). The levels consist of laminated to massive, ash turbiditic deposits with a cumulative thickness ranging from ~1 to 7 m depending on the presence of faults (Fig. 3). The volcaniclastic material is dominated by ash pyroclasts in the form of glass shards and pumices, with minor Pl, Opx, Cpx, Hbl and rare Bt crystals. Its composition spans from rhyolite to basaltic andesite and is typical of high-K calc-alkaline series, while its age is comprised between 2.18 and 2.30 Ma (Late Pliocene, or Early Pleistocene according to the last GSA Geologic Time Scale v. 5.0). Considering the structural, physical and chemical features of these levels, it has been recognized the provenance of the volcaniclastic material as likely from the Pontine Islands (e.g., Ponza) and Volturno Plain. Thus, ‘‘Le vulcanoclastiti di Craco’’ are ~~~150 to 250~~ km far from ~~what was/were~~ the hypothetical volcanic center(s), the Pontine one(s) ~~being~~ located at the northern end of the central Tyrrhenian arc ~~in Early Pleistocene (e.g., Prosser et al. 2008)~~.

47 ‘‘Le vulcanoclastiti di Craco’’ is an interesting example of geosite ~~as for the regional~~
48 ~~importance in~~ stratigraphic correlations in the Bradanic Trough, Mediterranean area.
49 These levels mark an exact time for clays of the second Pliocene cycle (Bentivenga et
50 al. 2005)~~;~~ they also mark the local landscape since a first glance. A further geological
51 interest adding charm to ‘‘Le vulcanoclastiti di Craco’’ is the provenance of the
52 volcaniclastic material. It is not surprising that the material traveled over a distance of
53 a hundred km downwind (≠ current source-Craco distance as for Tyrrhenian opening),
54 while is surprising the size of these secondary ash turbiditic deposits. One can think to
55 a significant explosive eruption occurred to the left of the Apennines Chain, and to a
56 resedimentation of the ash occurred in the deep sea (as for contiguous clays) to the
57 right of the chain. This is a precise reconstruction of the paleogeographic history of ‘‘Le
58 vulcanoclastiti di Craco’’ from genesis to transport mechanisms. On the other hand, it
59 is not straightforward to identify the exact eruptive events occurred during that Early
60 Pleistocene ~~eruption.~~

61

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76 FIGURE CAPTIONS

77 Fig. 1. Panoramic view of ''Le vulcanoclastiti di Craco'' and the landscape of ''calanchi''
78 in the background, Basilicata, Italy.

79 Fig. 2. Craco ghost town located at ~55 km south of Matera City, Italy (from
80 https://it.wikivoyage.org/wiki/Craco).

81 Fig. 3. Finely laminated, convolute to massive ash turbiditic deposits cropping out in
82 volcaniclastic levels around Craco.

Figure 1

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Figure 2

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Figure 3

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