

Paleoclimatic records from the Fuente Nueva 1 section (Orce, Guadix-Baza Basin, NE Granada, Spain): preliminary mineralogical data

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The mineralogical study of forty-five samples collected from the Fuente Nueva 1 (FN1) section (Orce, NE Granada, Spain) has been carried out using X-ray diffraction data on bulk powder and <2 µm fraction to the establishment the paleoclimatic record and the origin of the inputs into the basin. The FN1 section is located in the north-eastern part of the post-orogenic Guadix-Baza Basin, located in the central sector of the Betic Cordillera. During the Pliocene and Pleistocene, the Guadix sub-basin was dominated by alluvial and fluvial sediments, while the Baza sub-basin was dominated by lacustrine deposits. The FN1 section (in Baza basin) comprises a lower unit of Pliocene age consisting of lacustrine limestones and marls. Discordant on it, the Pleistocene is characterized by an alternation of two alluvial and two lacustrine episodes. In the first lacustrine episode is located the paleontological site of FN1 (approx. 2.3 Ma), which represents the oldest Pleistocene macrovertebrate site of Baza sub-basin. Moreover, this basin preserves some of the earliest evidences of human presence in Europe in several archaeo-paleontological sites correlated with the second Pleistocene lacustrine episode of FN1 section.

The climate during the deposition of FN1 section was temperate to warm-subarid with seasonal contrast as suggested the high occurrence of 2:1 layer phyllosilicates. The subarid conditions were more remarkable in the first Pleistocene alluvial episode as attested by an increase in palygorskite and precipitation of gypsum. Whereas, at the end of the second alluvial episode, the humid conditions were established as showed by lack in palygorskite and increase in illite and kaolinite. The variable quartz/phyllosilicate (Qz/Phy) relation suggests changing source areas along the deposited. Specifically, the high Qz/Phy and occurrence of muscovite and paragonite in samples at the end of the second Pleistocene lacustrine episode indicate a high detrital input from the Internal Zone outcrop in the south of the basin. Further studies include a precise characterization of morphology and geochemistry of the clay minerals in order to provide better paleoclimatical and paleoenvironmental characterization of basin.

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