Geophysical Research Abstracts
Vol. 18, EGU2016-6243-1, 2016
EGU General Assembly 2016

The Early Miocene-Early Pliocene Vegetation and Climate Changes at the north to northwest Çankırı -Çorum Basin (Central Anatolian Plateau)

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ABSTRACT

The ALErT project targets on climate and tectonic hazards in the densely populated regions in the Central Anatolian Plateau (CAP), within the framework of the Marie Curie FP7-PEOPLE-2013-ITN program, The CAP extends in a wide area in between zone the Aegean extensional zone and Bitlis /Zagros compressional zone. Çankırı Basin (in the middle CAP) is a key to understand aridification plateau interior and it was a deep pelagic Basin from Late Cretaceous –Early Tertiary as a result of the closure of Neo- Tethyan till the Middle Eocene. North to south of the Çankırı Basin; the Plio – Quaternary Değim formation (fluvial deposits) consist of massive mudstones and sandstones and it unconformable overlies the Bozkır formation (lacustrine deposits). That is a Messinian succession mainly by a 200 m-thick cyclic sequence of continental gypsum layers, clays and sandy clays in gypsum with different thicknesses crops. Bozkır formation, the lower being the contact with the Süleymanlı formation. It is overlay the Tuğlu formation with uncomformably, which is an Upper Miocene succession mainly composed of dark grey silty and organic rich clays. Following formation, which outcrops in the northwest of Çankırı basin, is Hançili formation. The unit is covered by grey sediments of the Hançili Formation, showing alternations of channel sandstones and clay stones over 100 m thick in Early - Middle Miocene in the Çankırı basin.

In this study, samples were analyzed for biotic proxy data (palynology) to figure the paleo-environmental and paleoclimate changes. Additionally only for Bozkir formation (longest section in the study area) were sampled for geochemical (δ18O - δ13C isotopes analyses and $CaCO_3$) analysis and the rest of the formations were interpreted using the previous study. In the most pollen spectra the herbs and shrubs prevail: in Değim formation (50%), in Bozkır formation (75%), in Süleymanlı formation (47%), in Tuğlu formation (60%) and in Hançili formation (57%) based on grasses, flowering herbs presence the vegetation shows top to bottom of the Çankırı Basin; a well-developed open grassland steppe environment with aquatic elements to low land. In Çankırı Basin, the paleoclimate is warm temperate with arid conditions during the Late Messinian. Based on calculated steppe index compared with Poaceae/ Asteraceae portion, we confirmed the Çankırı Basin has long term cooling trend and wet to dry conditions during Early Messinian to Plio-Pleistocene. It has been subdivided into the eight cycles with four dry period inside in it based on cluster analysis. Palynological data by evaluating the Past program data, the uplift during the Late Messinian in the north of Çankırı Basin has been confirmed and northwest part of the basin is more or less lower than north.

KEYWORDS: Çankırı-Çorum Basin, Central Anatolia, δ18O - δ13C isotopes, palynology, palaeo-environment.