Anatolia Plateau south margin: Tectonic inferences for the Miocene to present evolution

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The Neogene Central Anatolia Plateau (CAP), located between the Pontides in the north and Tauride mountains in the south and showing an average elevation of 1.5km, is one of the most interesting geologic features in Europe. The CAP encompasses all characteristics to enhance temporal and spatial plateau-building understanding, which is the main goal of the ESF-sponsored Vertical Anatolia Movement Project (VAMP). As part of the structural branch of the VAMP we aim to quantitatively comprehend the subsidence-uplift mechanisms, as well as, determine the accommodation structures of the south margin of the Anatolia Plateau and its age of growth. A general north to south description of the study area comprises the following elements; (i) high flat Anatolian Plateau interior, composed by Central Turkey continental basins, (ii) south plateau flank, extensively overlain by Miocene marine basins, (iii) offshore flank continuation in the Cilicia Basin, between Turkey and Cyprus, and (iv) south-verging Kyrenia thrust belt and the Messaoria Basin. The Miocene marine sediments presently found in southern Turkey, which were probably deposited in one single basin that was later divided into Mut, Manavgat and Adana Basins by formation of the Taurides, are essential to determine the main tectonic phases immediately preceding and contemporaneous with plateau development. Laying between Manavgat and Adana, Miocene Mut Basin is a key area to understand the tectonic history that existed in southern Turkey since Miocene. The present day structures and geometric architecture among the different units of the Mut-Ermenek Basin and surrounding areas are depicted in four E-W and four N-S geological sections stretching from Karaman in the Central Anatolian Plateau interior and from the west of Ermenek to the S and SE Turkish coast. They show a pre-Cenozoic paleotopography in highly-deformed metamorphic basement, unconformably overlain by relatively undeformed marine Miocene sediments. These Oligo-Miocene 2-3Km-thick relatively undeformed marine infill, some of which were deposited at infraneritic depths, is presently found at altitudes of 2000m in some points. Within the post-Eocene succession two different tectonic periods can be inferred; subsidence of the whole area during Miocene and post-Messinian uplift. Subsidence analyses of the area reveals basin tilting, with sediments emerging first in the northeast and then arising southwestwardly. In this contribution, using data from previous studies, cross-section data, basin analysis and structural fieldwork techniques, we aim to determine and quantify the character of Miocene to recent vertical movements and deformations underwent by Mut and Ermenek basins and surrounding areas to unravel the structural characteristics of the mountain range-foredeep-subduction system behind the vertical movements underwent by the southern flank of the Central Anatolian Plateau.

Keywords: Plateau, Miocene, Subsidence, Ermenek, Mut.