



Contemporaneous subsidence of the Levant basin and emergence of northwestern Arabia during the Late Eocene – Early Oligocene

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During the widespread Middle Eocene marine transgression, a large part of Arabia was covered by seawater. Later, the northwestern part of Arabia emerged while subsidence of the Levant basin accelerated. It is still not clear how much of the current elevation and structural difference between those two domains resulted from the Early Mesozoic continental rifting and how much from younger tectonic vertical motions. Here we focus on the young vertical tectonic separation between those domains and further suggest that it may be related to the onset of Arabia-Eurasia collision.

For this purpose we examined the transition zone between the westernmost Arabian plateau and the easternmost Mediterranean basin offshore central Israel. This transition is characterized by three sharp structural steps: 1. The eastern is a steep flexure along the western mountain front (WMF), separating the Judea mountain plateau from the lower foothill-coastal plain region. We point out that the Judea mountain plateau is tectonically, stratigraphically and morphologically the western continuation of the Arabian plateau. This situation wasn't significantly changed during the breakup of the Arabian sub-plate by the Dead-Sea Transform, except for the lateral offset and the short wavelength deformation close to it. 2. The middle step extends along the western coastal plain (CPS). This step is now buried under a thick Oligocene-Pleistocene sequence. 3. The westernmost step, extending along the base of the present continental slope, separates the deep Levant basin from the continental

margin.

We found that most of the structural difference across the two eastern steps postdates the Middle Eocene, as evident from: 1. a Senonian angular unconformity in the eastern step; 2. a similar Senonian to Middle Eocene marine sequence on both sides of these steps; and 3. the lack of pre-Late Eocene erosional products in this sequence along the foot of these steps.

The youngest constraint on the WMF structure resulted from Early Oligocene marine clasts, which date the erosion that truncated the folded layers of its upper uplifted part. This erosion phase formed the upper geomorphic surface at the top of the emerged Judea Mountains, probably as part of the extensive truncation that shaped the Arabian plateau. A Late Eocene – Early Oligocene age of the CPS is deduced from three contemporaneous, 800-1,000 m deep, crossing submarine canyons, in which Senonian to Middle Eocene strata are preserved at the shoulders whereas Late Eocene – Early Oligocene rocks unconformably overlie Early to Late Cretaceous rock units at the base of the canyons' filling

Therefore, it is concluded that the current morphology of the Levant margin was established during the Late Eocene– Early Oligocene, by a short tectonic event (ca. 5 Ma). This event reactivated the above-mentioned steps and increased the structural difference between the Levant basin floor and the Arabian inland by at least 1.5 km, and probably 2.5-3 km. Unlike the Senonian folding phase of the Syrian Arc deformation, which was mainly characterized by horizontal shortening over many short wavelength folds, this event is characterized by a prominent vertical deformation along specific lines, which are discontinuously aligned along the western margins of the Arabian plate. In a wider perspective, this event is contemporaneous with the onset of the Arabia-Eurasia collision along the Bitlis-Zagros suture of the Arabian northern margin, and may be related to it.