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# Tectonic origin and evolution of Rutba uplift West Iraq; Example of isostatic rebound

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The Rutba uplift is a north trending structure extends from North Arabia into the Iraqi western desert, displaced eastward across the ENE trending Anah graben and continued in the same direction in Al Jazzera area. Analysis of surface geologic and subsurface well and seismic data shows the following. The uplifting process started within the Silurian and resulted into folding and east dipping extensional fault(s) of the pre-Late Silurian sequence. The second stage started at the Permo-Triassic and continued as alternated long phases of activity and short phases of quiescence till the early Tertiary. South of Anah graben, the axis of the second phase is displaced westward from the older axis of uplift, north of it, both axes coincide.

The first stage uplift was differential and influenced the hanging wall of a major NNW trending relatively gentle east dipping normal fault. This asymmetrical uplift resulted in, counterclockwise rotation and folding of the pre-Late Silurian strata. An array of secondary steep east dipping normal faults was developed influencing the pre-Late Silurian sequence. Uplift was also associated with surface exposure and erosion. Later subsidence and sedimentation started in Late Silurian and resulted in deposition of horizontal strata of Late Paleozoic age.

The second stage of uplift with North trending axis, was started in Triassic and continued through the Mesozoic and early Tertiary resulted in south and east ward migration of shoreline with time progress. Continuous deposition and subsidence in the north Arabian passive margin, east of Abu Jir basin bounding major normal fault resulted in the corresponding uplifting and broadening of the Rutba high. Right lateral displacement (shift) in the depo-axis of the main passive margin basin across Anah graben is accompanied with similar shift in the axis of the uplift, suggesting the interaction between the two features. The second stage uplift is more symmetrical and boarder cause it is related to the subsidence of a bigger passive margin basin.

In short, the Rutba uplift is a major bend fold developed by two stages of deformation related to two stages of isostatic uplift. The older asymmetrical stage was controlled by gentle dipping normal fault and development of relatively small basin, whereas the latter was controlled by the development of much larger passive margin basin.