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Structural Analysis of the Tall Al Qarn Pressure Ridge, Dead Sea Transform

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Tall Al Qarn pressure ridge is one of the morphotectonic features formed along the active Dead Sea Transform in the Jordan Valley. The Dead Sea Transform extends from the Gulf of Aqaba to southern Turkey. In Jordan it consists of three morphotectonic segments; Wadi Araba, the Dead Sea basin, and the Jordan Valley. The Jordan Valley fault shows many pressure ridges and sag ponds. This study includes a detailed field investigation to describe the structural elements of the pressure ridge and to figure out the sequence of events affecting the ridge.

The outcropping rocks in the study area are Waqqas Formation (Miocene), Ghor al Katar Formation (Early Pleistocene) and Lisan Formation (Late Pleistocene). The ridge was formed due to the right bending (stepping) of the Jordan Valley left lateral strike slip fault. The main structures are: The steeply dipping Waqqas conglomerate. The positive flower structures indicating compressional stresses. Normal, reveres and strike slip faults are also observed crossing the different beds. The Ghor Al Katar beds were tilted and overlain by the horizontal Lisan beds forming a prominent angular unconformity. The Lisan beds in turn are also tilted and disturbed along the Wadi Al Qarn fault. The horizontal Lisan beds are disturbed by seismites indicating seismic activity.

The internal structure of the Tall Al Qarn coincides to some extends with the sandbox experimental model. There are many structural events associated with the formation of the pressure ridge; the tilting of the Ghor Al Katar beds, followed by the horizontal deposition of the Lisan Lake beds forming an angular unconformity. The horizontal Lisan beds were disturbed by seismites. Also the Lisan beds were tilted along the active Wadi Al Qarn fault. Historical and instrumental earthquakes indicate the recent seismic activity of the area.

Keyword: Tall Al Qarn, Pressure ridge, Dead Sea Transform, Jordan Valley, Wadi Al Qarn fault, Sandbox model.

Biography:

Professor Mohammad Atallah had his BSc and Msc in geology from the University of Jordan in Amman. He had his PhD in structural geology in 1986 from the Technical University of Munich, Germany. He joined the Yarmouk University in 1987. In 1994-95 he got a Fulbright scholarship in the New Mexico Institute of Technology. He works as visiting professor in some universities in Jordan and spent 4 years as visiting professor in Sultan Qaboos University in Oman. He supervised many Maser and Doctor Theses. His research interests are structural geology and active tectonics of the Dead Sea Tran.