

Micropaleontology of Mixed Carbonate and Siliciclastic of Miocene Dam Formation in the Al-Lidam area, Eastern Province of Saudi Arabia.

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Abstract

The study of foraminiferal from Tertiary formations especially in Eastern Saudi Arabia has not been fully documented compared to the Mesozoic carbonate and siliciclastic formations, which have been extensively investigated both in outcrop as well as subsurface samples due to their importance in Arabian petroleum system. Regionally, few micropaleontology studies have examined the foraminiferal distribution in the Dam Formation which is located in Dammam dome area, and Dam Formation from Southwest Qatar. Dam formation exposed in Al Lidam area however, has not been any reported recent investigation on the distribution of foraminifera.

Four outcrops along the west to east direction from the Al Lidam escarpment were investigated in this study for paleoenvironmental reconstruction and to understand the vertical and lateral distribution of foraminiferal assemblages. The samples were processed using standard acetic acid method, which extract foraminifera from the lithified carbonate rock without destroying the fossils content. Disaggregation using acetic acid shows yielded promising results, the foraminifera assemblage from the Dam formation dominated by calcareous porcellaneous *Miliolina* genera (*Quinqueloculina*, *Peneroplis*, *Triloculina*, *Cornuspira*, *Sigmoilinita*, *Coscinospira*, *Spirolina*, *Pyrgo*, *Borelis*), followed by hyaline forms (*Elphidium*, *Ammonia*, *Cibicides*, *Discorbinella*) and minor percentage of agglutinated forms e.g. *Textularina*.

The high percentage of calcareous porcellaneous taxa and the absence of planktonic foraminifera indicate that the Dam Formation was deposited in a restricted carbonate platform environment, very shallow hypersaline lagoon, gently sloping ramp (inner ramp) which is ranging from tidal flat to subtidal with local patch reef towards the basin, and deposited in arid subtropical environment with water temperature ranging between 20 to 35° C. Based on the observed assemblage composition, present day Arabian Gulf can considered as modern analogue for the Dam Formation during Miocene time. The present day environment have not changed drastically since the Miocene