

BIOSTRATIGRAPHY AND PALEOGEOGRAPHY OF ORDOVICIAN STRATA, IN KABIRKUH WELL#1, IN LURESTAN AREA, SOUTHWESTERN IRAN

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The Kabirkuh well #1 is located on the crest of Kabirkuh anticline which is the largest structure in the Lurestan area (Fig.1). The Kabirkuh anticline is 220km long and 10-12km wide with more than 2438m closure. The Kabirkuh well #1 is an exploration well which was spudded on the Lower Cretaceous Garau Formation in 1972 and completed in the Ordovician strata (= Seyahou Formation) by Oil Service Company of Iran in 1973. The purpose of drilling was to test the hydrocarbon potential of the Permian-Triassic strata in the Lurestan area and to ascertain the nature of subsurface stratigraphic column for further regional exploration requirements. The relationships of the drilled rock units from the Garau Formation (Lower Cretaceous) down to Dalan Formation (Permian) can be determined by diagnostic microfauna, whereas from depth of 2963m to 3157m are without foraminifers. Therefore, fifty three core and cutting samples were treated for palynomorph entities in order to determine the precise age of this interval. All samples contain well-preserved acritarch and chitinozoan assemblages. The acritarchs include 25 genera and 42 species. The diagnostic acritarch taxa consist of *Cristallinium dentatum*, *Cymatiogalea granulata*, *Cymatiogalea deunffii*, *Cymatiogalea philippotii*, *Pireia ornata*, *Dactylofusa velifera*, *Aureotesta clathrata* var. *simplex*, *Dasydiacrodium ancoriforme*, *Coryphidium bohemicum*, *Coryphidium persianense*, *Veryhachium trispinosum*, *Frankea sartbernardensis*, *Arbusculidium filamentosum*, *Arbusculidium iranensis*, *Striatotheca triangulata*, *Striatotheca trapziformis*, *Striatotheca transformata*, *Striatotheca quieta*, *Striatotheca principalis*, *Stellechinatum uncinatum*, *Aremoricarium deflandrei*, *Orthosphaeridium ternatum*, *Orthosphaeridium bispinum*, *Orthosphaeridium inflatum*, *Orthosphaeridium insculptum*, *Gorgonisphaeridium antiquum*, *Ordovicidium elegantulum*, *Multiplicisphaeridium bifurcatum*, *Multilicisphaeridium irregulare*, *Diexaplophasis denticulata denticulata*,

Dactylofusa spinata, *Rhopaliophora palmata*, *Voglandia flosmaris*, *Balisphaeridium christoferi*, *Polygonium gracile*, *Balisphaeridium perclarum*, *Veryhachium hamii*, *Tunisphaeridium eisenackii*, *Leiofusa fusiformis*, *Aremoricanium squarrosum*, *Actinotodissus crassus* and *Batisphaeridium constrictum*. The chitinozoan taxa comprise of 17 genera, and 20 species including of *Eremochitina brevis*, *Linochitina pissotensis*, *Siphonochitina formosa*, *Cyathochitina campanulaeformis*, *Cyathochitina kukersiana*, *Laufelochitina clavata*, *Eisenackitina* sp., *Hercochitina* sp., *Acanthochitina barbata*, *Desmochitina minor*, *Belenochitina micracantha*, *Lagenochitina baltica*, *Euconochitina lepta*, *Armoricochitina fistulosa*, *Rhabdochitina usitata*, *Rhabdochitina gracilis*, *Armoricochitina nigerica*, *Pogonochitina spinifera*, *Ancyrochitina merga* and *Tanuchitina elongata*. So far the above-mentioned acritarch and chitinozoan taxa have been recorded from Early (Floian), Middle (Dapingian-Darriwillian) and Late Ordovician (Sandbian-Hirnantian) strata elsewhere. Therefore, the drilled Ordovician interval of depth 2963m to 3157m in Kabirkuk well #1 is assigned to Early-Late Ordovician. Based on chitinozoan and acritarch taxa, the Lurestan area looks like Khuzestan and Fars areas can be assigned to North Gondwana Domain. Likewise, the Ordovician strata were investigated as source rock. As a result, 85-90% of organic matter is amorphous with TOC 1-1.5 % values. The acritarch taxa are also brown to gray with thermal alteration index 3.5-3.9 levels, suggesting generation of wet gas and condensates for Permian reservoirs (Faraghan and Dalan formations) which disconformably rest on Ordovician strata. Likewise, the presence of acritarch and chitinozoan taxonomically diverse assemblages, suggests a relatively shallow marine, platformal depositional environment, locating in medium-high palaeolatitudes.



Fig. 1. Location map of studied area.