

**Outcrop based γ -ray measurements and detailed facies analyses of the Natih Fm in Jabel Akdhar area of Oman:
a powerful tool for improving surface to sub-surface correlation**

Frijia, G.¹

1) Sultan Quaabos University, Muscat, Oman, E-mail: gfrijia@libero.it

The upper Albian to Lower Turonian Natih Fm. of Oman (and equivalent stratigraphic units in the Arabian Peninsula) is one of the most studied, prolific source rock interval and hydrocarbon reservoirs of the country. It rests conformably on the carbonate/clastic Nahr Umr Fm. whereas its top is marked by a large regional unconformity, the base Aruma unconformity. This latter developed due to the extensive erosion during the mid Turonian caused by the bulging of the continental lithosphere associated with SW-ward obduction of the Oman ophiolites. The Natih Fm. is overlain by the Muti Fm which represents the infill of the foreland basin derived from the eroded Natih Fm. starting in the Late Turonian. Beside this major unconformity the deposition of the Natih Fm. was interrupted several times by subaerial exposures with emersion and incision. All these erosional events caused locally different stratigraphic patterns making often problematic a precise correlation of the Formation from East to West and from subsurface to surface.

The Natih Fm. has been generally subdivided by petroleum geologists in seven informal members (g to a, from bottom to top) based on cores and on characteristics patten of gamma-ray and density log curves. The adaptation of this subsurface nomenclature into surface lithostratigraphic “members” is extensively used mainly because of the need to study outcrop sections as analogues of the subsurface. However, correlations among members are not quite straight forward. Significant heterogeneity in platform growth associated to complex diachronous infill of accommodation and erosional episodes can be found from East to West of northern Oman. Furthermore, the lithological properties and boundaries of these members can locally be very confusing and a rock outcrop-comprehensive description of them is still lacking thus hampering a precise comparison with well data.

The aim of the study is to build high resolution outcrop-based γ -ray profiles throughout Natih Fm. members e to a, anchored to detailed facies analyses. The studied sections are located in the southern part of the Jabel Akdhar area and represent an ideal transect from platform top to intrashelf setting. The obtained γ -ray curves will serve as reference curves for the Natih Fm. is surface sections. We will show how detailed outcrop γ -ray measurements allow for high-resolution correlation with subsurface data. We will also show how local sedimentary variations in the studied members can be easily detected and we will discuss the possible reasons. Finally, we will precise/refine the definition of the “informal” Natih members.