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### On the way of the discovery of new hydrocarbon targets in Tunisia: The main geological particularities of "tight" proven reservoir rocks

In Tunisia, hydrocarbon production from the two main oil fields respectively called El Borma and Ashtart, clearly declined. Actually, great efforts are furnished to explore new targets which are less obvious and particular in terms of reservoir quality and trap types. In fact, with new technological work flows combining geophysical, geological and petrophysical approaches, explorers are invited to focus on "tight reservoirs" and stratigraphic traps. The fine-grained textures in "tight reservoirs" are generally the result of lateral facies changes closely linked to the sedimentary systems and the paleogeographic setting. The consolidation degree and hardness, especially of the sandstone reservoirs, are directly related to diagenetic modifications that are frequently burial and linked to overburden. In Tunisia, three main petroleum provinces are distinguished:

- The onshore southern and Saharan Tunisia, including Paleozoic petroleum systems.
- The onshore-offshore Central Atlasic Tunisia, characterized by Mesozoic petroleum systems
- The onshore-offshore Northern Tunisia, including Mesozoic-Cenozoic petroleum systems

The best high-quality reservoir in Tunisia consists of Triassic sandstones (called "TAGI"), producing oil in the El Borma field (the biggest in Tunisia) located in the Saharan province. The second oil field called "Ashtart", located in the South-East offshore Tunisia, produced oil from a carbonate nummulitic-rich reservoir, offering high values of porosity and permeability. The main purpose of our work is to present the main petroleum system characteristics of other still underexplored hydrocarbon provinces that could be attractive now or in a near future. The petroleum systems in these provinces are particular since they include "tight reservoirs". On the basis of a multidisciplinary approach, using sedimentological, petrophysical and organic geochemical methods, we will try to demonstrate how such types of tight reservoir rocks, especially quartzites, chalky limestones, silty fine-grained carbonates, could produce or, at least, exhibit hydrocarbon shows. The case-study of the Aptian "M'Cherga" reservoir in Central-Northern Tunisia, for example, shows that in addition to fracturing, certain sedimentary processes and diagenetic modifications could obviously enhance the reservoir potential of these fine-grained rocks. On the other hand, this work will focus on the main characteristics of the potential source rocks, particularly their maturation and the main hydrocarbons migration pathways to reservoir rocks.

#### Biography

Mohamed Hedi Negra, is Professor of Geology at Tunis El Manar University, Faculty of Sciences of Tunis since 2003 and teacher since 1984 (34 years experience). He has published more than 45 papers in reputed journals. He has participated to the organization of 6 International Meetings, Workshops and Courses and has presented more than 70 Oral communications and Posters in International and National meetings.

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