Regional Syntheses of the Miocene successions in Libya and the Mediterranean, with emphasis on Eocene and Cretaceous in Sirte Basin

Salah El-Ekhfifi [a], Khaled S. Amrouni [b], Imhamed Ilhamali [c]

[a] *Exploration Geologist, NOC, Libya, selekhfifi@noc.ly*
[b] *PhD, Texas A&M University, abcde_909@yahoo.com*
[c] *Geological Advisor, NOC, Libya*

Key words: Cyrenaica, Mediterranean, Offshore, Petroleum, Africa

Introduction The Cretaceous, Eocene, and Miocene successions in Libya and the Mediterranean have significant importance from a petroleum system point of view. These regions are known for their prolific hydrocarbon reserves and the onshore regions have been extensively explored and developed.

Methodology In these paragraphs, a synopsis of the regional syntheses of these successions is composed and a comparison with their analogues wherever needed was done. The presentation will shed a light on a detailed study that has been conducted on Cyrenaica Platform in Northeast-Libya, utilizing sedimentology, sequence stratigraphy, diagenesis, handheld gamma-ray analysis, and carbon stable isotope analysis. Additionally, this presentation will also uncover the results of Arous Al-Bahr discovery in the offshore of Sirte Basin-Libya, assess the geological presence of these successions and finally define the Miocene succession in the Mediterranean.

Discussion and Results During the Cretaceous period, North Africa and Mediterranean region were part of a larger tectonic plate known as Pan-African Plate.

The Onshore Sirte Basin contains significant cretaceous sedimentary rocks, which are part of the larger Saharan platform. These rocks consist of a series of marine and non-marine deposits. These deposits extend offshore Sirte Basin, and the drilling of Arous al-Bahr (A1-54/01) discovery well & its appraisal proved the presence of thick sedimentary sequences of Cenomanian -Turonian succession, which have been possibly charged by the underlying source rocks (Silurian hot shale).

The Eocene successions are well-exposed in Cyrenaica platform and are prolific onshore and offshore Sirte Basin (i.e., Gialo Fm in many fields; A1-54/01 well).

Regarding the Miocene succession, three main facies are identified with significant thicknesses and lateral continuity, namely Oolitic limestone, Microbial facies, and Coralline red algae. These facies are considered important for subsurface analogues, providing valuable insights into the depositional and environmental conditions during the Middle Miocene.

Overall, the Cretaceous and Eocene successions in Libya have been extensively explored and produced, forming significant petroleum systems, while Miocene rocks require more attention.