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Contribution to the stratigraphy of Murzuq Basin, SW Libya
From the View of NC-115 Data

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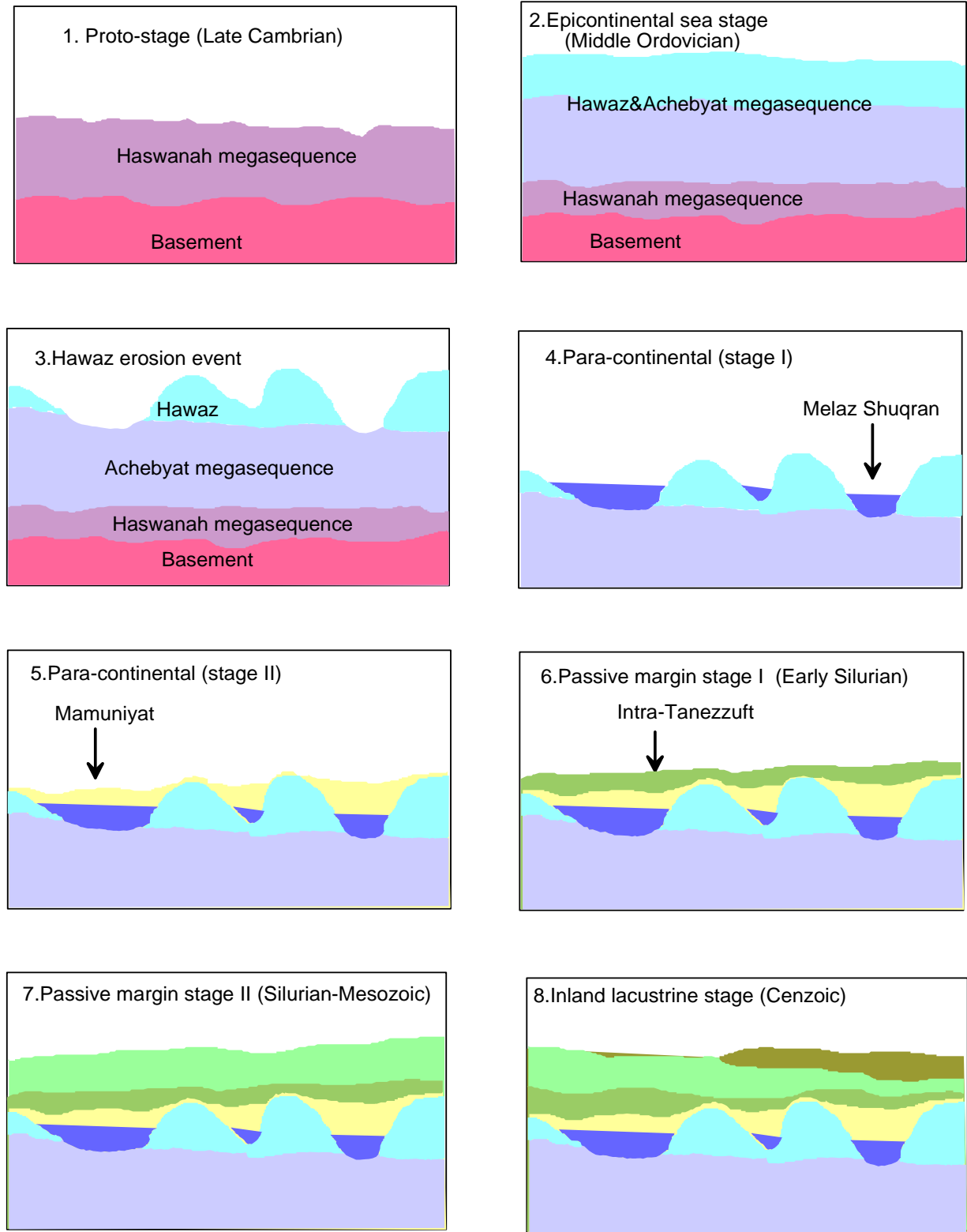
NC-115 is one of the most petroliferous concession, which has been found so far within Murzuq Basin. Within its 4,300 Km² area, four oil fields (A, B, H, and M) have been discovered, producing from Hawaz and Mamuniyat reservoirs. The complexity of the stratigraphic framework and the variety of hydrocarbon occurrence in NC-115 could be a good exploration example for the other concessions within the Murzuq Basin, and probably the Gadhama Basin as well.

A geological/geophysical assessment of the NC115 block has been conducted to evaluate hydrocarbon potential by making best use of all the available data, including well data (logs, cores, biostratigraphic analysis, etc), outcrops, and seismic data. The methodology of sequence stratigraphy was selected to perform such a comprehensive study, which resulted in building a chronostratigraphic framework of the area and establishing the geologic evolution of Murzuq Basin.

Five geological evolution stages for the region are proposed. They are proto-stage, epicontinental sea stage, para-continental stage, passive margin stage and inland lacustrine stage. Three megasequences are defined for the pre-Silurian systems. They are assigned to be equivalent to previous lithological units, Hasawnah and Achebyat, Hawaz, Melaz Shuqran and Mamuniyat. Three stratigraphic units are introduced to the subsurface for the first time, they are Achebyat, Pre-Melaz Shuqran Sandstone and Hirnantian Shale. The Pre-Melaz Shuqran Sandstone is an informal unit identified through this work. The Hawaz Formation has been subdivided into Upper and Lower members, based on outcrop and well data. Palynological age dating reveals Purgillian (Lower Ashgillian) for the Melaz Shuqran which was separated from the overlying Mamuniyat (Upper Ashgillian) by a stratigraphic break with the missing of Mid-Ashgillian (Rawtheyan-Cautleyan) sediment.

Keywords: Achebyat; Hirnantian shale; Murzuq Basin; Mid-Ashgillian; Pre-Melaz Shuqran

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(Figure I)

Cartoon showing major evolution stages of Murzuq Basin from the view of NC-115 data