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Palynology and Stratigraphy of the Nubian Sandstone in Libya and Comparison with Egypt

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ABSTRACT

The so-called “Nubian Sandstone” outcrops along a wide area from Algeria to the Red Sea, forming two regressive phases. The lower phase is represented in Egypt by the Basal Clastic Unit, the Desert Rose Unit, the Abu Ballas Formation and the Matruh Shale. In Libya it is represented by the Mesak Sandstone, Sarir Sandstone, Cabao Sandstone and Kiklah Formation. In both countries, these successions
are covered by a carbonate sequence, resulting from the Tethyan transgression during the Cenomanian. In Egypt however, the upper regressive phase is represented by the Taref Sandstone which was deposited during a brief period of active progradation, following the Tethyan incursion. This is not observed in Libya.
Comparison of palynological studies in Libya with those documented by several authors in Egypt reveals that the “Nubian” facies in Libya were deposited before equivalent facies in Egypt. The Basal Clastic Unit, dated as Hautrauvian-Barremian, may be equivalent, at least to a part of the Neocomian Cabao Sandstone in NW Libya. Jarmah Member of the Mesak Formation in Libya was dated as Berriasian on the basis of Pilosisporites and Trilobosporites. This makes it older than any “Nubian” unit in Egypt. The Matruh Shale was assigned to the Aptian on the basis
of Tricolpites, and the Abu Balls Formation 34 as Aptian-Albian on the basis
of Tricolpites and Rousisporites radiatus. Whereas, there is no equivalent to the Aptian in NW Libya, the Aptian-Albian of Egypt is similar to Zone 1 of the Kiklah Formation and As Sarir Sandstone, which were
dated as early Albian on the basis of Afropollis spp., and Perotriletes pannuceus, an Albian element not recorded in Egypt. The Plant Beds in southwestern Egypt were dated as Cenomanian on the basis of advanced angiosperm pollen. In Libya, equivalent bodies were considered Vraconian, representing the uppermost Albian, because it lacks Cenomanian pollen (e.g. Tricolpites mutabilis).
Comparison of local sea-level changes with global sea-level curves is used to reconstruct paleogeography. Integration of palynology with geological data and tectonic implications indicates that, despite similarity in paleogeographic processes of the Nubian Sandstone, geological and structural settings remain different. The “Nubian Sandstone” provides a typical succession that can be studied in the light of sequence stratigraphy.