Correlation of nonmarine Cretaceous strata of Africa and the Middle East

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Abstract

Nonmarine Cretaceous rocks of mainly Early to mid-Cretaceous age are found widely scattered throughout the African continent, including Madagascar and the Middle East. Correlation of these rocks between regions has been attempted in the northern part of Africa, but the less frequent outcrops south of the Sahara are poorly understood and correlations are very tentative. It is premature to attempt a continent-wide correlation scheme, but inter-regional correlations are presented to understand better the nonmarine Cretaceous throughout Africa and the Middle East. The Saharan region is dominated by nonmarine "Continentale Intercalaire" and "Nubian Sandstone" clastics of Early to mid-Cretaceous age, and in Egypt, locally Late Cretaceous. The rocks labelled "Nubian Sandstone" can be correlated into the Arabian Peninsular, where it was deposited around the Arabian craton prior to inundation by Tethyan transgressions. The opening of the South Atlantic invoked tectonic stresses forming pull-apart basins in West Africa, and exploited the Pan-African shear zone cutting central Africa forming basins from Nigeria to southern Sudan. Intracratonic basins in northern Sudan and Egypt resulted from tectonic stresses associated with the opening of the Red Sea and the northward convergence of Africa into the European continent. Nonmarine Cretaceous deposits in central and inland south-eastern Africa outcrop sporadically and are associated with regional extensional tectonics related to the separation of Madagascar. Coastal basins of Mozambique and South Africa containing marginal nonmarine Cretaceous facies appear to be associated with the separation of Madagascar and the Falkland Plateau from Africa. The ages of nonmarine Cretaceous strata in Africa and the Middle East are often imprecisely known, although recent palynostratigraphic results have improved precision. Vertebrate and megaplant fossils are found throughout the continent, but their biostratigraphic value is rather general. Nonmarine sedimentation in Africa and the Middle East is predominantly pre-Cenomanian, with some Upper Cretaceous rocks occurring in Egypt, Somalia, Yemen, Nigeria and Madagascar during regressive episodes.