



Palaeohydrology of the Fazzan Basin, Libyan Sahara

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The Fazzan is a large closed basin with an area of 450,000 km², located in south-western Libya. The present-day climate is hyper-arid, with less than 20 mm of rainfall per annum. However, regionally extensive limestones, lacustrine sands, coquina (fossiliferous carbonate rock) and fine grained lake deposits demonstrate that the Fazzan Basin previously contained a large palaeolake, here termed Lake Mega-Fazzan. Although the Sahara contains evidence of several other large palaeolakes, of which Lake Mega-Chad is best known and largest, Lake Mega-Fazzan is the only one fed exclusively by rivers draining the Sahara proper. Thus, the Lake Mega-Fazzan sediments provide an important resource for advancing our understanding of climate change in this part of the Sahara. However, systematic examination of this palaeoclimate record has, to some extent, been hindered by the relative paucity of dateable material from within these deposits. Optically stimulated luminescence (OSL) dating techniques have been applied to a range of lacustrine deposits within the basin to provide an internally consistent chronology for the Fazzan humidity record. Results indicate that sediments within the Fazzan Basin record a very long history of palaeohydrological change. The oldest lacustrine sediments are beyond the range of conventional OSL dating techniques, but younger humid periods during oxygen isotope stages 11, 5 and 1 are recognised. These results, when compared with similar studies of adjacent closed basins, indicate that the Sahara may not always have provided as formidable a barrier to faunal migration as it does at present. The implications of this finding for our understanding of African biogeography and palaeoanthropology will be discussed.