

Chronology of the Eocene continental deposits of Africa: Magnetostratigraphy and biostratigraphy of the El Kohol and Glib Zegdou Formations, Algeria

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Abstract

Despite numerous discoveries that have considerably enriched the African-Arabian Tertiary fossil record over the last decades, our knowledge of the evolutionary history of many continental African vertebrate groups during the Paleogene period remains inadequate, particularly when it is compared with the fossil records of Europe or North America. The Eocene Epoch in Africa is especially poorly documented, being restricted to few fossiliferous localities. Our understanding of the early Tertiary emergence, diversification, and

paleobiogeographic history of African-Arabian mammals has been further hindered by the lack of a precise temporal framework for these sites.

We conducted magnetostratigraphic analyses, associated with biostratigraphic studies, in the fossiliferous sequences exposed in the northwestern Hammadas of the Saharan Platform in the Glib Zegdou area and in the Saharan Atlas at the El Kohol locality (Algeria) to further define the age of these Eocene continental deposits. Based on biostratigraphic constraints, the six polarity zones identified in the El Kohol section can be correlated with chrons C24n to C22r, providing the first direct age estimates for the El Kohol fossiliferous strata between 52 and 51 Ma. Correlation to the geomagnetic polarity time scale, using previously published biostratigraphic data for the Glib Zegdou fauna, suggests an age ranging between 49 and 45 Ma for this section.

The high-resolution magnetostratigraphic study of the poorly known continental Eocene Epoch of Algeria provides new insights into the early Tertiary stratigraphy of northwest Africa. The placement of the Algerian localities into a consistent chronological framework constitutes considerable advancement to achieve biostratigraphic correlation of the Paleogene African-Arabian mammal localities.

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