



Magnetostratigraphy of Cenozoic sediments from the Xining Basin, and its tectonic implications for the northeastern Tibetan Plateau

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The Xining sub-basin of the Longzhong basin holds the longest continuous Cenozoic stratigraphic record at the margin of the northeastern Tibetan Plateau. Despite a rich biostratigraphic content (including the Xiejia mammal fauna), the tectonic evolution of the basin is largely unconstrained. In this study we present stratigraphic, biostratigraphic, and magnetostratigraphic results that provide a basis for reconstructing the Cenozoic tectonic evolution of the Xining basin with respect to adjacent regions of the northeastern Tibetan Plateau. Magnetostratigraphic analysis from three red bed sections in the Xining basin indicate continuous deposition at low and nearly constant accumulation rates (average 2.2 cm/kyr) from 52.0 to 17.0 Ma. We interpret this result to indicate that no major regional tectonic event implying large sediment accumulation variations has affected the Xining basin deposition during this considerable time window. In detail, accumulation rate variations outline a three stage evolution with 1.8 cm/kyr from 52.0 Ma to 34.5 Ma, 3.9 cm/kyr from 34.5 to 33.0 Ma and 2.4 cm/kyr from 33.0 to 17.0 Ma. These second order variations can be interpreted to result from either a distal tectonic event or to be of climatic origin. Although the region was tectonically quiescent for much of the Cenozoic, tectonic activity occurred during basin initiation at ca. 55.0-52.5 Ma and during intense basin deformation after 17.0 Ma.