Angular unconformities between Cretaceous and Tertiary in Kurdistan Region, NE-Iraq

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Abstract

In this study, two angular unconformities are found and analysed for the first time in the Mesozoic–Cenozoic succession in the northwestern segment of the Zagros fold–thrust belt (ZFTB) in the Kurdistan Region. The first unconformity exists between Lower Cretaceous and Paleocene–Eocene rocks and the second between the Campanian Shirani sh Formation and the Maastrichtian Tanjero Formation. Each of these unconformities is found in two different localities in the Zagros Imbricate Zone (i.e. the highly deformed zone immediately SW of the Zagros Suture) of the ZFTB of the Kurdistan Region near the border with Iran. The study uses recent geological mapping, structural and stratigraphic analyses in addition to using previous biozonation of the stratigraphic units that bound the two unconformities. The first unconformity was initiated with obduction of the ophiolite and Lower Cretaceous radiolarite onto the passive margin of the Arabian plate. This unconformity formed during an early phase of the Zagros orogeny, which is associated with the developing of a foreland basin, and resulted in the folding of the radiolarites and their uplift to form high-relief land. The erosion of this high-relief land resulted in the formation of the Paleocene–Eocene Red Bed Series and their deposition on the folded radiolarite. The timing of the deformation that caused this unconformity is hard to determine; however, its stratigraphic position may suggest that it possibly is related to post-Cenomanian movements. The second unconformity is between the tilted Campanian Shiranish Formation (hemipelagite) and Tanjero Formation (500 m of conglomerate in the more proximal area). These unconformities indicate that deformation and uplift of the sedimentary units was variable during ophiolite obduction in this part of the ZFTB. We argue that deformation, ophiolite obduction and collision are likely to have varied in space and time along the c. 2000 km long ZFTB. Keywords: angular unconformity, Zagros fold–thrust belt, Kurdistan Region, obduction, Tanjero Formation, Red Bed Series, Qulqula Radiolarian Formation.