



Age of the M0r

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The onset of the magnetic polarity chron M0r was traditionally proposed as the primary marker for the basal age of the Aptian stage. M0r has close relationships with many Cretaceous abnormal geological events, such as CNS, OAE1a, ontong Java eruption and so on. Moreover, the age of M0r was used as key point to construct the M-sequence magnetic polarity time scale and to assume the Pacific Ocean spreading rate. Thus, a precise absolute age of the M0r is crucial to our understanding of the relationships among the formation of major basalt provinces, geomagnetic reversals, ocean anoxia and mass extinctions as well as global stratigraphic correlation, paleoenvironmental and paleoceanographic changes.

GTS2004 tied the age of M0r to an $40\text{Ar}/39\text{Ar}$ age of 124.6 ± 0.3 Ma (after correction to TCR monitor standards of Renne et al., 1998) for a geomagnetic reversal in the basement sequence at ODP site 878, MIT Guyot, western Pacific (Ogg, Agterberg and Gradstein, *The Cretaceous Period*, p344-383, in: Gradstein, Ogg and Smith (eds), *A Geologic Time Scale 2004*). However, whether the dated reversal corresponds to M0r or M1r remains contentious (Pringle and Duncan, 1995; Opdyke and Channell, 1996). In addition to increasing the duration of the CNS, the newly proposed M0r age of 125Ma also shift the underlying M-sequence and associated biostratigraphic and stage boundaries through the Tithonian. Therefore, more examinations should be done on the age of M0r.

We carried out integrated paleomagnetic and geochronologic investigation on Cretaceous lava flows at the Mashenmiao-Zhuanchengzi (MZ) sections in Yixian, Liaoning, northeast China in seeking to understand the onset of the polarity chron M0r and

the Barremian - Aptian boundary (BAB) accordingly. Stepwise thermal demagnetization indicated that all lava flows in both sections were reversed magnetized. The new $^{40}\text{Ar}/^{39}\text{Ar}$ ages obtained from three lava flows are $121.2 \pm 1.3\text{Ma}$, $120.2 \pm 1.5\text{Ma}$ and $122.0 \pm 1.3\text{Ma}$ respectively, with a weighted mean age of $121.2 \pm 0.5\text{Ma}$ (2s). In combination with other previous studies, we argue that the obtained new age may represent the approximate age of M0r and BAB accordingly, although more systematic geochronologic work is needed.

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