Clockwise rotation of the eastern margin of North China: paleomagnetic data from Korea and Japan

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Southwest Japan and Korean Peninsula are located in the eastern part of the Asian continent. It has been believed that these regions were originally eastern parts of the North China Block. This study presents a relative tectonic movement in the eastern part of the North China Block, based on new paleomagnetic data from Southwest Japan.

Welded tuffs in the Upper Cretaceous Arima Group have been collected at four sites in the Ikuno area (35.2N, 134.7E) in the middle of Southwest Japan. Thermal demagnetization isolated characteristic remanent magnetization components with unblocking temperature of 580C from all the sites. After tilt correction, the characteristic directions provide Late Cretaceous mean direction (D=78.4, I=44.7, a95=9.5) and a paleomagnetic pole (24.1N, 210.0E, A95=8.5) for the Ikuno area. The paleomagnetic pole from the Ikuno area is in good agreement with coeval poles from the central part of Southwest Japan. The pole for the Ikuno area together with previously reported ones give a new Late Cretaceous pole representative of the central part of Southwest Japan. This pole is rotated 64.6 +/- 15.5 degrees clockwise with respect to the coeval one for the North China Block.

The tectonic history of Southwest Japan includes Early Tertiary clockwise rotation of about 23 degrees and Middle Miocene clockwise rotation of about 42 degrees, resulting in a total rotation of Southwest Japan by 65 degrees. The Early Tertiary clockwise rotation occurred in an area incorporating the Korean Peninsula and Southwest Japan, and the Middle Miocene clockwise rotation was associated with the opening of the Japan Sea.