MIOCENE CLOCKWISE ROTATION OF SOUTHWEST JAPAN AND FORMATION OF CURVATURE OF THE MEDIAN TECTONIC LINE: PALEOMAGNETIC IMPLICATIONS

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In order to investigate the origin of the curvature of the Median Tectonic Line (MTL), we carried out a paleomagnetic study in the eastern part of Southwest Japan. Paleomagnetic directions of the collected welded tuffs (55-66 Ma) have a clockwise deflected declination (D=51.7, I=52.6, a95=8.6) which is consistent with the characteristic Paleogene paleomagnetic direction of the central part of Southwest Japan, but the amount of rotation of the eastern area is 23deg. smaller. We conclude that the curvature of the MTL is a composite of the 15 Ma strike-slip fault system which comprised the present N-S segment of the MTL and the Akaishi Tectonic Line. And a small bend of the MTL associated with the differential rotation of the Nohi area with respect to the central part of Southwest Japan.

The origin of the curvature of the Median Tectonic Line (MTL) in Southwest Japan is still controversial. In order to investigate the formation, we carried out a paleomagnetic study in the Nohi area, north of the curved part of the MTL in the eastern part of Southwest Japan. More than 420 paleomagnetic samples were collected at 35 sites from Cretaceous to Paleogene welded tuffs in the Kasagatake Rhyolites, Oamamiyama Group and Nohi Rhyolite. Characteristic directions with high unblocking temperature component above 560C are isolated from 32 sites. Paleomagnetic directions of the Kasagatake Rhyolites and Oamamiyama Group (55-66 Ma) have a clockwise deflected declination (D=51.7deg., I=52.6deg., a95=8.6deg.) which is consistent with the characteristic Paleogene paleomagnetic direction of the central part of Southwest Japan. A similar deflected declination is also observed in the peripheral part of the Nohi Rhyolite region, far away from the Atera fault system. Paleomagnetic data indicate that the Nohi area experienced a clockwise rotation through more than 45deg. with respect to the Asian continent as a part of Southwest Japan but that the amount of rotation of the Nohi area is 23deg. smaller than that of the central part of Southwest Japan. A new model is developed to explain the tectonic rotation. At about 15 Ma during the latest stage of the clockwise rotation of Southwest Japan, the eastern end moved southward by more than 60 km along a left-lateral strike-slip fault which comprised the present north-south segment of the MTL and the Akaishi Tectonic Line. We conclude that the curvature of the MTL is a composite of the 15 Ma strike-slip fault system and a small bend of the MTL associated with the small differential rotation of the Nohi area with respect to the central part of Southwest Japan.