

## Geology, geochronology and paleomagnetism of the Upper Cenozoic in the eastern part of Shimane Prefecture, SW Japan

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Clockwise rotation of SW-Japan was first proposed by Otofujii and Matsuda (1983). Following refinement of paleomagnetism and geochronology data for Tertiary rocks in Shimane Prefecture, it was concluded that SW Japan had rotated clockwise by about 50 degrees during a span from 16 to 14 Ma (Otofujii et al., 1991). The geological structure of Miocene strata in Shimane Pref. differs between the northern part and the southern part of the Shinji Rift Zone.

In this paper, we report geology, geochronology and paleomagnetism of Upper Cenozoic rocks in the southern part of Izumo City and Shimane Peninsula and discuss its tectonics.

1.[Southern area of the Shinji Rift Zone]1-1)Oyorigiyama Volcanics:Hornblende K-Ar age: 38.6 $\pm$ 2.0Ma. Paleomagnetic direction (n=9) of high temperature component, 500-650deg.C \*) [D=70.3; I=31.4; a95=8.1; k=41.5]\*\*) [D=71.6; I=45.1; a95=8; k=42.6](\*)with tilt correction, \*\*)without tilt correction).The Oyorigiyama Volcanics Fm. was clockwise rotated about 70deg. east.

1-2) Some lavas previously assigned to the middle Miocene Kawai Fm. have a whole rock K-Ar age of 20-17Ma. These lavas are therefore excluded from the Kawai Fm, and are here newly defined as the Sada Fm. The Sada Fm. show declination of 37.1-62.3 degrees east and inclination of 29.6-66.0 degs. 1-3) Some volcanic rocks of the Hata Fm. and its equivalent with a whole rock K-Ar age of 16.3 $\pm$ 1.2Ma have paleomagnetic directions of [D=26.0; I=45.6 a95=6.2; k=390]\*\*and [D=199.6; I=32.6, a95=7.5; k=104]\*). 1-4) The Hata Formation (Fm.) had previously been considered to be not lower but middle Miocene in age (Sawada et al., 2008). The direction of the middle Miocene Hata Fm. (16.1-14.5Ma) and Omori Fm. (15.1-14.0Ma) are similar to the present geomagnetic direction or are the reverse of it, indicating that they are not rotated, and thus formed after the rotation of SW Japan.

2.[Shimane Peninsula] Based on this study and Saito(2003MS), Matsui(2004MS) and Inada(2007MS), the paleomagnetic directions of lower and middle Miocene can be summarized as; 2-1) About one third of 79 measured samples of the lower Miocene Koura Fm. have a high temperature magnetic component (primary magnetization), and precision parameters of many samples are less than 10. For some samples with precision parameters are more than 24, the paleomagnetic directions\*)are [D=97.7; I=67.5 a95=15.0; k=38.7 (n=14)] [D=87.3; I=39.1, a95=1.8; k=24.4, (n=3)]\*) in the eastern part of the peninsula, and [D=103.5; I=60.4, a95=10.3; k=56.5, (n=5)]\*). 2-2) The paleomagnetic directions without tilt correction of the middle temperature component(200-500deg.C) of the lower Miocene Koura Fm. and middle Miocene Jyosoji Fm. are similar to the present geomagnetic direction [D=0.5-11.3; I=49.9-66.0, a95=12.3; k=30.5-83.9].Paleomagnetic directions with tilt correction of the middle Miocene Ushikiri Fm. which overlies the Jyosoji Fm. are similar to the present geomagnetic direction.

3. In the southern part of the Shinji Rift Zone, 39Ma volcanic rock has paleomagnetic declinations of about 70 degs. east. Volcanic rocks 20-17Ma in age have declinations of 37 to 62 deg. east. The 16.3Ma volcanic rocks have declinations of 26-20 east, which may indicate that SW Japan was still experiencing a clockwise rotation at that time. The timing of rotation of SW Japan and NE Japan (Baba et al., 2007) is similar. In Shimane Peninsula, the lower Miocene shows declinations of near 90deg. east. The paleomagnetic directions before tilt correction of the middle temperature components of the lower Miocene Koura Fm. and middle Miocene Jyosoji Fm. are similar to present geomagnetic direction in the case without tilt correction. On the other hand, the paleomagnetic directions after tilt correction of the overlying middle Miocene Ushikiri Fm. are similar to present geomagnetic direction. This suggests that the tilting of lower Miocene and middle Miocene Jyosoji Fm. had been ended before the deposition of the Ushikiri Fm.