



Volcanisms and Earthquakes Related to the Pacific Plate Subduction in Northeast Asia

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It is very known that an integrated plate system displays in Northeast Asia from the Pacific Plate subduction zone via arc islands and back-arc basin to the continental margin with rifting system. Based on this geological background many huge earthquakes and volcanic eruptions occurred in this area from the Mesozoic to the present such as Fujiyama Volcano in Japan, Cheju Volcano in South Korea, Changbaishan Volcano in China and M 7.3 deep focus earthquake in Wangqing, Northeast China of June 28,2002, M9 earthquake in Northeast Japan of March 11,2011 and so on. Now it is tectonic active phase in the Northeast Asia, even in the globe.

The Changbaishan Volcano is huge volcanic group with some 12×10^3 km² area and hundreds volcanic cones crossed the boundary between China and Korea covered 41°-42.5° latitude north and 127°-129° longitude east. It is among largest active and dangerous volcanoes on the Globe and composed of three main volcanoes (eruptive centers): Tianchi(2755 m a.s.l.), Wangtian'e (2438m a.s.l.) and South Paotaishan (2434m a.s.l.), which distribution assumes as tripod. These three eruptive centers have similar magma system and different ages. They were built from the Early Miocene to the Recent by basaltic flow as lava plateau, trachyte composing of volcanic cones and pyroclastic deposits covering the tops of the mountains and other places. Tianchi volcano is younger than others. According to historic documents the largest eruption of Tianchi volcano occurred in 1014-1019 AD., after that there were still several eruptions until 1903 AD. The frequencies of Changbaishan volcanic eruptions corresponded to those of the Pacific, especially Japan.

There is systematic magma evolution from basic basalt, intermediate trachyte to acid pantellerite with $^{87}\text{Sr}/^{86}\text{Sr}$ 0.704771-0.710096, $^{143}\text{Nd}/^{144}\text{Nd}$ 0.512487-0.512602, which indicated that the magma derived from rich mantle. Geophysical data reveal a buried magmatic reservoir is lying below the volcanoes.

Recently, the west Pacific fire ring is very active accompanied with frequent volcanic eruptions and earthquakes; the earthquake frequency and intensity and geochemical anomaly also obviously strengthen in the surrounding of Changbaishan volcanoes. It reveals that volcanic activity and possibility of re-eruption is going to strengthen. Therefore we must put attention to volcanic action.