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## Geological evolution of the Hakone volcano: Kuno's classical model vs. recent model

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The Kuno's classical model of the geological evolution of the Hakone volcano is famous for Japanese volcanologists and contributed so much to the development of volcanic geology in Japan, but Kuno's model was proposed before the appearance of plate tectonics. The theory of plate tectonics yielded the view that the Izu-Ogasawara arc is colliding with Honshu arc just around the Hakone volcano, which has greatly influenced the geological evolution of the Hakone volcano. The recent model based on the active tectonics around the Hakone volcano is different from Kuno's classical model. The Kuno's classical model is as follows; (1) the construction of a basaltic to andesitic large conical stratovolcano just like the Fuji volcano, associated with parasitic volcanoes such as the Kintoki andesitic polygenetic volcano and Makuyama dacitic monogenetic lava dome, (2) the collapse of a large stratovolcano without volcanic activity gave rise to the Glencoe-type older caldera, (3) the effusion of thick andesitic to dacitic lavas filled the older caldera to construct a shield volcano, (4) the explosive large-scale eruption of dacitic magma resulted in the collapse of shield volcano to form the Krakatau-type younger caldera, (5) the central cone has been built in the younger caldera.

Contrarily, the recent model based on the active tectonics related to the arc-arc collision is as follows; (1) from 0.65 to 0.23Ma, a lot of basaltic to andesitic intermediate to small scale polygenetic volcanoes were constructed, associated with some andesitic monogenetic volcanoes, (2) from 0.23 to 0.13Ma, the NW-SE trending graben with monogenetic volcano group cut across the volcanic edifice under the extensional tectonic regime, in the central portion of which several small scale Nigorikawa-type older calderas were constructed by large scale explosive eruptions of felsic magma, (3) from 0.13 to 0.08Ma, the eruption of dacitic to andesitic magmas in the central portion of caldera gave rise to many thick monogenetic lava flows, accompanying explosive eruptions of felsic magma, (4) from 0.08 to 0.04Ma, felsic large scale explosive eruptions occurred, the largest one of which was the eruption of Tokyo pumice resulted in the formation of Nigorikawa-type younger caldera, (5) from 0.04Ma to recent, the andesitic central cones have been constructed; the volcanic activities since 0.13Ma were restricted to the central part of the Hakone volcano, because the pull-apart structure related to the Tanna-Hirayama left lateral strike-slip fault system, cutting the central portion of the Hakone volcano, has been formed.

Keywords: Hakone volcano, volcanic history, caldera, stratovolcano, monogenetic volcano, tectonics