

Geological features of Dalinor volcanic swarm, Inner Mongolia, NE China

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The volcanic activities occurred pervasively in NE China in Cenozoic era. The Dalinor volcanic swarm, composed of a hundred volcanoes of varied sizes and shapes, is located on the Dalinor lava plateau in the southeastern region of Inner Mongolia. Most of the Dalinor volcanoes are central eruption or central-crevasse eruption style, leaving cluster of volcanic cones with height of 50-130m outstanding in the lava plateau. The volcanic cones were denuded through the long-term geological evolution. According to their geomorphology, the existing volcanic cones could be roughly classified into four types: single truncated conical, composite, shield, and residual. The different denudation degree of the cones imply the relative eruption sequence of volcanic activities.

The morphology measurement of a volcanic cone is an effective tool to determine the relative age of a volcano. The ratio of cone height to diameter was obtained by subtracting the cone bottom diameter from the crater diameter, which can reflect the formation time of a cone to a certain extent. The overall evolutionary process of a cone from new to old can be roughly considered as conical → shield → residual, though, the existing cone morphology doesn't always match the eruption time. As the conical and composite volcanoes located in the central part of the plateau, the shield ones usually located in the margin, and the residual ones widely distributed in the volcanic field, which together indicate the volcanoes in the plateau margin formed earlier than those in the central, i.e. the volcanic eruptions migrated from the margins to the center of the Dalinor lava plateau, while the even earlier large scale tholeiite overflowed and formed the base of the lava plateau.