



Reconstruction of volcanic activity at Sedankinsky Dol lava field, Sredinny ridge, during the Holocene (Kamchatka, Russia) based on tephrochronological studies.

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Volcanic activity within the northern part of Sredinny Ridge of Kamchatka is still enigmatic and one of the most debatable problem of Kamchatka volcanism. This area is situated more than 100 km N of the edge of subducting Pacific plate and origin of magmatism here is of broad scientific interest. Magma generation in this area could be assigned to: (1) fluids from the subducting Pacific plate triggering mantle melting, (2) melting of the Pacific plate edge and [Avdeiko et al., 2001, Yogodzinski et al., 2001] (3) to mantle plume activity [Portnyagin et al., 2003]. Here we report preliminary results on chronology of volcanic activity within the Sedankinsky Dol lava field, which is an area of most voluminous volcanism in the northern Sredinny Ridge during the Holocene, based on tephrochronological and radiocarbon dating. This area is situated 100 km NW from Shiveluch, the northernmost active volcano in Kamchatka and comprises several small shield- and stratovolcanoes and more than 100 monogenetic cones. All the erupted rocks are of basaltic, basaltic andesite in composition. Detailed tephrochronological investigations allowed to established regional marker ash layers scheme going back up to 9000 yrs BP which we used to reconstruct the history of volcanic activity in this area. Based on depositional characteristics, mineral assemblages and geochemistry features we recognized two widespread marker ash layers: KS1 and KHG with ages 1700 and 6900 14C BP [Braitseva et al., 2002], respectively and several distal ashes of Shiveluch volcano (from 970 to 8300 14C yrs BP in age). Our geological and tephrochronological studies revealed three main stages of the volcanic activity within the Sedankinsky Dol: (1) Late Pleistocene, (2) Early Holocene and (3) Late Holocene. Most of shield- and stratovolcanoes were formed before or during the

II stage of Late Pleistocene glaciation. All these edifices as well as cinder cones of this age have been glacially eroded or covered with glacial deposits. Total volume of the erupted products is more than 4-5 km³. Volcanic centers of Early Holocene stage were formed after the II stage of Late Pleistocene glaciation but before 7000 14C yrs. These edifices and their lava flows do not have any traces of glacial erosion but covered with KHG ash layer. Corresponding proximal tephra are sandwiched between glacial deposits and KHG ash or older Shiveluch ashes. The Late Holocene stage is marked by appearance of several monogenetic volcanoes and voluminous eruption of Titila volcano, which is probably the only known potentially active Iceland-type shield volcano in Kamchatka. Their tephra are sandwiched between two Shiveluch ashes having the age of about The total volume of erupted products of the Early and Late Holocene stages is about 1.0 km³. Established periods of volcanic activity correspond rather well to those Eastern and South Kamchatka testifying to close relationship of magma generation processes at this region and areas of clearly subduction-related volcanism. However close spatio-temporal coexisting of volcanic centers with island-arc and intraplate geochemical characteristic, as it was previously reported [Dirksen et al., 2004, Perepelov et al., 2004], suggests rather complex character of magma generation for this area. Our tephrochronological and geological investigations have additional importance for archeological studies in Kamchatka. Studied area was one of the main bridges for west-east migration of reindeer-breeding ancient tribes due to the low height of the mountains in this area as well as wide distribution of tundra vegetation favourable for reindeer. Voluminous Late Holocene volcanic and high frequency of tephra falls, as thick as 10 cm, during the last could strongly affect tundra vegetation, which is very sensitive to environmental changes. It could forced tribes to change their traditional routes of migration or even breaks off the west-east intercourse for some time.