The Formation Mechanism of Volcano-Tectonic Event Deposits of the Middle Pleistocene Kokubu Group, South Kyushu, Japan

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The Kokubu Group, distributed in the northern coastal area of the Kagoshima Bay, South Kyushu, is composed of shallow marine to lacustrine deposits formed under the condition of vigorous volcanic activities in the Kajiki Sedimentary Basin which is considered as the northern extension of the Kagoshima Graven. This group rests unconformably on the Pliocene to Early Pleistocene volcanic basement rocks and is overlain by the Middle to Late Pleistocene pyroclastic flow deposits. Based on lithologic differences, the Kokubu Group can be divided into seven formations. Among these, three formations namely: the Nabekura, the Obama, and the Oda Formation are considered to have formed from the volcano-tectonic event deposits under the same geologic process. Such can be ascribed to the repeated vigorous eruptions of pyroclastic flows followed by the subaqueous abrasion of bottom sediments by a large amount of gravels and sands that flow into the sedimentary basin. The layers of these coarse pyroclastic sediments are accompanied by mega-mud clasts and are associated with the development of a large-scale, low-angle cross-stratifications which is suggestive of Tsunami deposits formed under violent flow conditions. The results of analysis of the conjugate faults in the Kokubu Group imply that these volcano-tectonic events might had occurred under the tension stress condition of the basement rocks of the Kajiki Sedimentary Basin which is believed to have resulted from the geotectonic evolution process of the Kagoshima Graven.