Geology of the Towada district (Quadrangle Series, 1:50,000) - with special reference to Miocene to Pliocene volcanism -

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The Towada district is located in Aomori Prefecture, in the east of Hakkoda volcanic group, and the northeast of Towada volcano. A flexure zone extending to N-S exists in the central zone of Towada district. The western region of this flexure zone uplifts and constitutes Ou Backbone Range. On the other hand, the eastern region subsides relatively and forms gentle terrace surfaces and hill topography. In the eastern region, Late Pliocene Togawa Formation mainly consisting of sandstone constitutes the basement, and is unconformably overlain by Pleistocene Noheji Formation mainly consisting of sand and Pleistocene to Holocene fluvial terrace deposits. In the western region, Middle Miocene Wadagawa Formation and Douchi Formation consisting of mudstone and siltstone constitute the basement. Late Miocene to Early Pliocene Komasuzawa Formation consisting of pumice-lapilli tuff, tuffaceous sandstone, and basalt-andesite lavas conformably overlie Douchi Formation. In the northwest region, Late Pliocene Hachimandake-Kuromori volcanic rocks unconformably overlie Komasuzawa Formation. Pleistocene Hakkoda 1st- and 2st-Stage pyroclastic flow deposits from the Hakkoda caldera unconformably overlie the Neogene rocks. Towada Hachinohe pyroclastic flow deposits (1.5 ka) from the Towada caldera is distributed over the whole area broadly.

Most of basalt-andesite lavas of the Late Miocene Komasuzawa Formation occurs as hyaloclastites. The depositional environment of the Komasuzawa Formation was in the shallow sea. Several submarine volcanoes existed in this age and supplied the pumice-lapilli tuff and tuffaceous sandstone to the surrounding area. Those volcanic activities occurred around 8 Ma. The Late Pliocene Hachimandake-Kuromori volcanic rocks consist of terrestrial basalt to andesite lavas. Those volcanic rocks are divided into Tsukushimori volcano, Kuromori volcano, and Hachimandake volcano based on the distribution and topography. Those volcanic activities occurred between 3-1.5 Ma. The east ends of the distributions of the Komasuzawa Formation lavas and Hachimandake-Kuromori volcanic rocks are located in 14 km and 8 km east from the Quarternary volcanic front, respectively. In this way, the volcanic front gradually moved westward from Late Miocene to Quarternary in the vicinity of the Towada district.