論　説

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北海道奥尻島，勝澗山火山の噴出物と構造

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Eruption Products and Structure of Katsuma-Yama Volcano, Okushiri Island, Hokkaido, Northern Japan

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This paper describes the eruption products and structure of Katsuma-Yama volcano. Katsuma-Yama volcano is located in the northern part of Okushiri Island off the Oshima Peninsula, Hokkaido and has three eruption centers: Horonai-Gawa caldera, Katsuma-Yama crater and west Katsuma-Yama crater. Horonai-Gawa caldera is 2 km by 1.5 km in dimension, and is filled mainly with massive breccias to tuff breccias, fine-grained lacustrine sediments and bedded lapillistone to tuff. Massive breccias to tuff breccias are exposed along the western wall of the caldera and have been recovered by drilling in the central portions of the caldera. The breccias contain fragments mainly of dacite, dacite pyroclastic rocks, andesite, and granodiorite together with minor fragments of perlitic rhyolite. The majority of the rock fragments are quite similar in their constituents and textures to the surrounding basement rocks. Perlitic rhyolite, however, is relatively fresh and cannot be recognized in the surrounding basement rocks. This rock is, therefore, thought to be juvenile, although no eruption products remain outside the caldera. The fine-grained lacustrine sediments are wavy stratified with a wavelength up to a few meters and locally contain sulfur deposits. Bedded lapillistone to tuff comprises mostly fragments of glassy biotite-rhyolite, and projectiles derived from the direction of Mt. Katsuma Yama formed sag structures in the beds. Katsuma-Yama crater occurs at Mt. Katsuma Yama. The crater has a diameter of 740 m across and is filled with bedded lapillistone to tuff. The constituents are mostly non- to poorly vesicular polyhedral or platy fragments of glassy biotite-rhyolite and are thought to be phreatomagmatic in origin. Although the outflow deposits partly remain on the western and southeastern flanks of Mt. Katsuma Yama, most of the expected pyroclastic ring or cone has been removed through later erosion. Katsuma-Yama lava of similar composition occurs through the crater infill, spreads over the eroded surface of the outflow deposits, and is distributed mainly on the southwestern flank of Mt. Katsuma Yama and further to Horonai-Gawa caldera. The lava has a thickness of 100 m at Mt. Katsuma Yama, thins to the downflow directions with a variable thickness of flow breccias, and is intruded into the infill of Horonai-Gawa caldera, with plastic deformation of the caldera deposits along the contact. West Katsuma-Yama crater opens through Katsuma-Yama lava at its western margin, with a diameter of 180 m. The major infillings comprise rock fragments mostly similar to those from the Katsuma-Yama crater. A minor volume of pyroclastic surge deposits from this crater remains on Katsuma-Yama lava in the summit area of Mt. Katsuma Yama, and rests on the brown soil of a few centimeters that covers the eroded surface of the western rim of Katsuma-Yama crater. The eruption volume from Horonai-Gawa caldera is unknown but could be between 1 and 10 km^3. The eruption volume from Katsuma-Yama crater perhaps slightly exceeds 0.6 km^3, and the eruption volume from west Katsuma-Yama crater is very small, perhaps

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less than 0.01 km^3. Katsuma-Yama lava is dated by fission-track methods to be 0.2–0.7 Ma, and no soil occurs between the lava and the overlying pyroclastic surge deposits of the west Katsuma-Yama crater origin. A thin brown soil between the pyroclastc deposits of Katsuma-Yama and west Katsuma-Yama craters represents a short dormancy in volcanic activity. Lacustrine deposits in Horonai-Gawa caldera indicate a high wave-energy setting. Sulfur precipitated in the deposits suggests fumarolic activity in the caldera lake. These facts likely demonstrate post-caldera volcanism, and the plastic deformation of the caldera fill by the intrusion of Kamui-Yama lava suggests that the post-caldera volcanism was succeeded by the activities of Katsuma-Yama and west Katsuma-Yama craters.

Key words: Katsuma-Yama volcano, rhyolite, phreatomagmatic eruption, caldera, Pleistocene

1. はじめに

勝澗山（かつまやま）火山は，北海道南部渡島半島沖合 30〜60 km の日本海に浮かぶ奥尻島の第四紀火山である (Fig. 1)．奥尻島は南北 20 km, 東西 10 km の奥尻海嶺上の島で，その約 60 km 南には活動的な渡島大島火山がある．さらに渡島大島火山の南方 110 km には久六島火山，そして久六島の南方 70 km には戸賀火山（鹿野・他，2002）や目潟火山がある．すなわち，勝澗山火山は，これら火山とともに東北日本弧の最も背弧側に位置する第四紀の火山列をなしている．

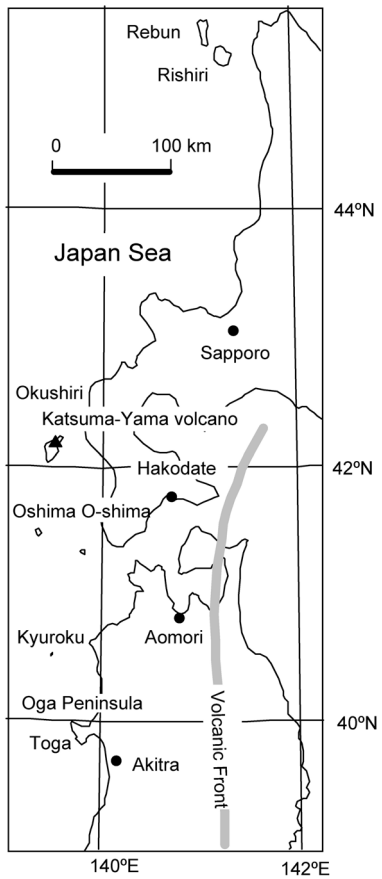

Fig. 1. Location of Katsuma-Yama volcano, Okushiri Island.

勝澗山（標高 427.7 m）は，奥尻島の北部，幌内川上流北側に位置する．これがガラス質流紋岩溶岩からなることは古くから知られていた（鈴木・園木，1935，1936）が，日本の火山（一色・他，1968）では火山として認定していない．勝澗山が火山として認定されたのは日本の火山第 2 版（小野・他，1981）が初めてであろう．日本の第四紀火山カタログ（第四紀火山カタログ委員会，1999）中では，宇井・中川 (1999) が，これを分布面積 4 km^2, 体積 0.2 km^3 の流紋岩溶岩（勝澗山流紋岩: 秦・他，1982）からなる小規模な中期更新世の単成火山としている．しかし，これまでに勝澗山火山に関する火山地質学的記載は殆どなされていないため，その実態は不明である．

本論文では， 2003 年と 2004 年に勝澗山とその周辺を筆者らが調査した結果を基に，この火山の噴出物と構造について報告する．

その名称については，日本の火山第 2 版（小野・他，1981）では，これを奥尻火山とし，日本の第四紀火山カタログ（第四紀火山カタログ委員会，1999）では奥尻（勝澗山）火山としており，正式な名称についての合意は得られていない．小野・他 (1981) が与えた奥尻火山という名称は，より広い奥尻という地名にちなんでおり，場所を特定する上では，勝澗山火山とする方が分かりやすい．勝澗山火山という名称は既に宇井・中川 (1999) が非公式に与えているが，本論文ではこれを正式名称とすることを提案する．

勝澗山火山は，従来考えられていた溶岩ドーム（勝澗山流紋岩: 秦・他，1982）よりも複雑で，三つの噴出中心を持つ．勝澗山山頂付近には勝澗山火口（新称）と勝澗山西火口（新称）があり，勝澗山南側，幌内川上流域には，これらの火口が開口する前に形成された幌内川カルデラ（新称）がある (Fig. 2)．

勝澗山火口からは流紋岩火砕サージ・火砕流が噴出した後に，流紋岩溶岩（勝澗山流紋岩: 秦・他，1982）が噴出している．勝澗山西火口は，勝澗山火口から噴出した