

## トカラ列島における中期更新世の酸性海底火山活動

横瀬 久 芳\* 佐 藤 創\* 藤 本 悠 太\*  
Maria Hannah T. MIRABUENO\*\*\* 小 林 哲 夫\*\*  
秋 元 和 實\*\*\* 吉 村 浩\*\*\*\* 森 井 康 宏\*\*\*\*  
山 脇 信 博\*\*\*\* 石 井 輝 秋\*\*\*\*\* 本 座 栄 一\*\*\*\*\*

### Mid-Pleistocene Submarine Acidic Volcanism of the Tokara Islands, Japan

Hisayoshi YOKOSE\*, Hajime SATO\*, Yuta FUJIMOTO\*,  
Maria Hannah T. MIRABUENO\*\*\*, Tetuo KOBAYASHI\*\*,  
Kazumi AKIMOTO\*\*\*, Hiroshi YOSHIMURA\*\*\*\*, Yasuhiro MORII\*\*\*\*,  
Nobuhiro YAMAWAKI\*\*\*\*, Teruaki ISHII\*\*\*\*\* and Eiichi HONZA\*\*\*\*\*

#### Abstract

To understand the submarine volcanism surrounding the Tokara Islands, a submarine topographic analysis and 67 dredge samplings were carried out. Prior to the submarine investigations, we reviewed comprehensively geological and geophysical data on this region and confirmed the complexity of both volcanic activity and tectonic setting of the Tokara Islands. In contrast to the homogeneous subaerial volcanic rocks comprising predominantly two-pyroxene andesite lava flows, the dredged samples vary from basaltic andesite to rhyolite in composition. Furthermore, we reveal that dacitic and rhyolitic pumices are abundant and broadly distributed throughout the submarine area. The recovered volcanic rocks were mainly subangular to angular cobble-boulder fragments of lava, scoria, and variably vesiculated pumice. Volcanic rocks with hornblende phenocrysts occur only north of the Tokara strike-slip fault, which is a major tectonic element of volcanism.

The pumices can be classified into three categories based on the size and abundance of the

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\* 熊本大学大学院自然科学研究科

\*\* 鹿児島大学大学院理工学研究科

\*\*\* 熊本大学沿岸域環境科学教育研究センター

\*\*\*\* 長崎大学水産学部

\*\*\*\*\* 東京大学海洋研究所

\*\*\*\*\* 熊本大学理学部

+ 現所属：Philippine Institute of Volcanology and Seismology

++ 現所属：深田地質研究所

+++ 現所属：鉦研工業株式会社

\* Graduate School of Science and Technology, Kumamoto University

\*\* Graduate School of Science and Engineering, Kagoshima University

\*\*\* Center for Marine Environment Studies, Kumamoto University

\*\*\*\* Faculty of Fisheries, Nagasaki University

\*\*\*\*\* ORI University of Tokyo

\*\*\*\*\* Faculty of Sciences, Kumamoto University

+ Present address: Philippine Institute of Volcanology and Seismology

++ Present address: Fukada Geological Institute

+++ Present address: Koken Boring Machine Co., Ltd.

phenocrysts: aphyric pumice, fine-grained porphyritic pumice, and coarse-grained porphyritic pumice. Occurrences, such as amount in a dredge, shape without extensive abrasion, large fragment size, and bulk rock chemical compositions of the major pumice fragments suggest that they are in situ, rather than originating as drifted pumice or air fall, exotic pyroclastic fragments derived from the four super-eruptions of Kyushu Island. Because dredged samples contained fresh volcanic glass in the groundmass, and are not covered by iron-manganese oxide crust, they appear to have originated from the Quaternary eruptions. Indeed volcanic islands have developed above the submarine erosional terraces (indicated as knick points at approximately 110 m in depth), which is assumed to have formed during the last glacial age. K-Ar age dating on the representative pumice samples resulted in ages of  $0.60 \pm 0.20$  Ma and  $<0.2$  Ma, respectively. These newly obtained submarine data support that acidic volcanisms occurred around the submarine calderas during the Mid-Pleistocene age.

**Key words** : submarine volcano, submarine caldera, Tokara Islands, Ryukyu arc, Mid-Pleistocene volcanism, Tokara strike-slip fault

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