Letter

Bull. Volcanol. Soc. Japan
Vol. 52 (2007) No. 4, pp. 241–244

AMS Radiocarbon Dating of a Charcoal Fragment from the Irosin Ignimbrite, Sorsogon Province, Southern Luzon, Philippines

Ma. Hannah T. Mirabueno*,**, Mitsuru Okuno***, Toshio Nakamura****,
Eduardo P. Laguerta*****, Christopher G. Newhall******
and Tetsuo Kobayashi*******

(Received, June 28, 2006; Accepted, May 14, 2007)

The eruption of dacitic to rhyolitic pyroclastic flows, Irosin ignimbrite, resulted in the formation of the Irosin caldera in Bicol Peninsula, southern Luzon, Philippines. This paper presents the AMS (Accelerator Mass Spectrometry) ^{14}C date of charcoal fragment from the Irosin ignimbrite that is distributed in the province of Sorsogon. The obtained ^{14}C age is 35,930±250 BP (NUTA2–10795), and tentatively calibrated to the calendar year of 41,329±169 cal BP. This new age result contributes to the study of the Irosin caldera and to the database of widespread tephra deposits in the Philippines.

Key words: Irosin caldera, Irosin ignimbrite, AMS ^{14}C dates, Philippines

1. Introduction

The Philippine Institute of Volcanology and Seismology (PHIVOLCS, 2002) identifies 22 active and 27 potentially active volcanoes in the Philippine archipelago. Among the active volcanoes, Bulusan volcano (12°46.2′N, 124°03.0′E), which is located in the province of Sorsogon in the southern end of the Bicol Arc, southern Luzon (Fig. 1) has erupted in recent historic times. Bulusan volcano is generally known for sudden occurrence of phreatic type of eruption. The most recent volcanic activity involved a series of phreatic eruptions which started from March 2006 until 24 January 2007 (http://www.phivolcs.dost.gov.ph).

This stratovolcano is one of the post-caldera cones of Irosin caldera. The caldera was formed by the eruption of the Irosin ignimbrite, which is mostly massive, poorly to moderately sorted, dacitic to rhyolitic pyroclastic flows, and distributed widely around the caldera (Delfin *et al.,* 1993; McDermott *et al.,* 2005). Previous radiocarbon (^{14}C) ages of 33,500±150 BP, >34,000 BP and >36,000 BP (Newhall, unpublished data) for the ignimbrite plotted within the 33–36 kyr BP range but near the limit of ^{14}C detection.

In order to refine the chronology of the caldera formation, we performed ^{14}C dating with accelerator mass spectrometry (AMS) of charred wood fragments collected from the Irosin ignimbrite. This paper presents the result of the ^{14}C dating and discusses the eruption age of the ignimbrite. This new age is important not only in understanding the eruptive history of the Irosin caldera and associated volcanoes such as the active Bulusan volcano, but also in providing a chronological framework of the volcanism of the Bicol Arc.

2. Outline of the Irosin caldera

The Irosin caldera, together with the active Bulusan volcano and associated older volcanic centers in various stages of erosion, comprise the Bulusan Volcanic Complex (BVC). The rim of the caldera forms a semicircle showing a strong topographic expression and steep gra-

* Graduate School of Science and Engineering, Kagoshima University, 1–21–35 Korimoto, Kagoshima 890–0065, Japan.
** Philippine Institute of Volcanology and Seismology (PHIVOLCS), C.P. Garcia Avenue, University of the Philippines, Diliman, Quezon City, Philippines.
*** Department of Earth System Science, Faculty of Science, Fukuoka University, 8–19–1 Nanakuma, Jonan-ku, Fukuoka 814–0180, Japan.
**** Center for Chronological Research, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464–8602, Japan.
***** Mayon Volcano-Ligñon Hill Observatory, Philippine Institute of Volcanology and Seismology (PHIVOLCS), Ligñon Hill, Legazpi City, Philippines.
****** Formerly U.S. Geological Survey, United States of America.
******* Department of Earth and Environmental Science, Faculty of Science, Kagoshima University, 1–21–35 Korimoto, Kagoshima 890–0065, Japan.

Corresponding author: M. H. T. Mirabueno
e-mail: e05hanah@eniac.sci.kagoshima-u.ac.jp