

A Note on Biogenic Effects of Coralloid Speleothems in Round Mountain Lava Cave, Oregon, U.S.A.

Naruhiko KASHIMA · Takanori OGAWA

Abstract

Coralloid speleothems from Round Mountain lava cave are studied by scanning microscope and electron microprobe analyses. Scanning microscopy observation indicates that the diatom *Melosira* seems to contribute significantly to siliceous coralloid speleothems. Electron microprobe confirms the presence of diatom and fragmental minerals (plagioclase and orthopyroxene) in coralloid speleothems.

Chemical analysis of 3 diatom cells gives SiO_2 (74.8%), Al_2O_3 (0.12%), FeO (0.11 %), CaO (0.47%) and MgO (0.81%).

I. Introduction

Round Mountain lava cave is situated about 1.3 miles south of the Round Mountain Pass on the Route 2016, Deschutes County, Oregon, U.S.A. The entrance opens in a shallow crater floor near the top of Round

Mountain(5,909 feet) at latitude $43^{\circ} 45' 26''N$ and longitude $121^{\circ} 42' 43''W$ (Fig. 1).

Initial description of coralloid speleothems in this cave was given by HALLIDAY(1952). According to his definition, the coralloid speleothems are "1/2 inch projections of unidentified mineral deposits."

A photograph and detailed observation of coralloid speleothems were reported by Larson(1980). He described some coralloid speleothems : they are siliceous precipitates, ranging in shape from spiny to botryoidal and ranging in color from dirty gray to dirty brown, and are comparatively soft and easily damaged.

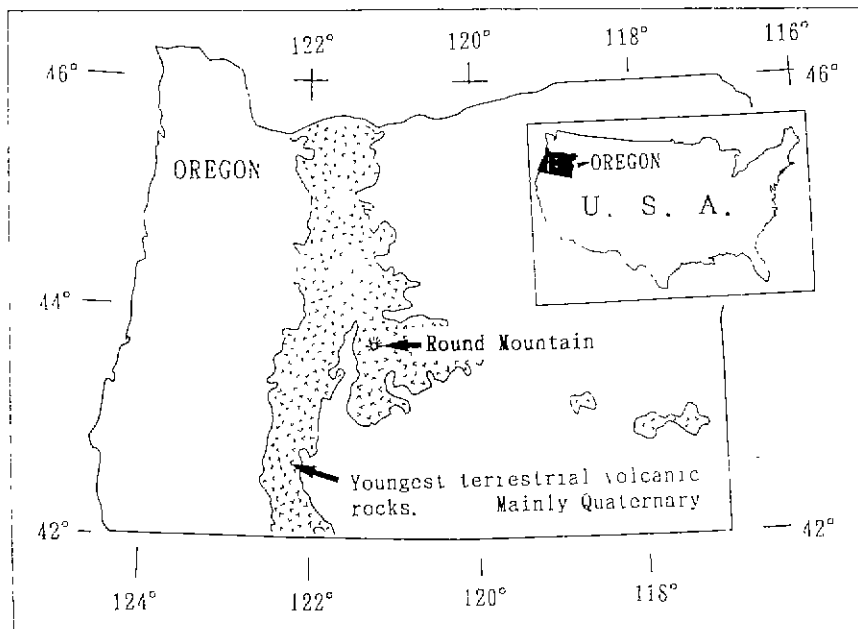


Fig. 1. Locality map showing a portion of Round Mountain, Oregon U.S.A (after KING, P. B., 1969).

On June 23, 1982, one of the writers(T.O.) visited Round Mountain lava cave, and obtained some specimens of coralloidal speleothems.

Scanning microscopic scrutinies and electron microprobe analysis of these specimens proved that coralloid speleothems were built up by siliceous precipitates with diatom colonies and detrital minerals.

This paper deals with a detailed characterization of coralloid speleothems.

II. Material and Methods

Specimens of coralloid speleothems were collected from cave walls at the middle portion approximately 20 feet below the entrance.

Mineralogical determination was not made by powder X-ray diffractometry, because the X-ray diffraction pattern of a specimen of coralloid speleothems contained no peaks.

Some selected chips of coralloid speleothems were cemented on a brazen stub with electroconductives and coated with Au. These specimens were observed with Scanning microscope.

The major element analysis of polished sections of coralloid speleothems were carried out by using an electron microprobe.

III. Results

The diatom colony is distinctive because of their general morphology, their size and their cell surface frameworks, and is considered to belong to the genus *Melosira*.

The Cylindrical diatom colonies have subsequently lost their cell surface frameworks by siliceous mineralization.

IV. Conclusive Remarks

In this paper, the diatom of the genus *Melosira* was identified on the specimens of coralloid speleothems from Round Mountain lava cave, which can be interpreted to mean that deposition of coralloid speleothems was induced by biogenic support of diatom.

The writers suspect that the diatom flora may directly help the deposition of coralloidal speleothems in non-calcareous caves.

Acknowledgments

The writers are very grateful to Dr. W. HALLIDAY, Western Speleological Survey, For giving valuable support of this work. They also wish to thank H. MATSUURA, Department of Earth Sciences, Faculty of Science, Ehime University, for many valuable electron microprobe analysis.

References

- Kashima, N., 1986, Cave formations from non-calcareous caves in Kyushu, Japan, *Communs, 9, Espeleol., Barcelona, 1986, 41-43.*
- Larson, C., 1980, Round Mountain features coralloids, *The Speleograph, 16(98).*