

## Estimation of paleoclimate changes from $^{14}\text{C}$ of speleothem from the Ryugashi Cave, central Japan

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Speleothem  $^{14}\text{C}$  has recently emerged as a potentially powerful proxy for hydrology changes in comparison with atmospheric  $^{14}\text{C}$  calibration curve. Some possible causes for the relationship between speleothem  $^{14}\text{C}$  content (or dead carbon fraction: DCF) and karst hydrology have been proposed, such as changes in temperature, precipitation, and drip water flow dynamics. Minami *et al.* [1] investigated seasonal variation in  $^{14}\text{C}$  of drip water in Ryugashi Cave, Shizuoka Prefecture, central Japan. The drip waters were collected at dripping sites having conduit dominated flow paths. The  $^{14}\text{C}$  in the drip waters roughly correlated with rainfall amount around the Ryugashi Cave. This indicates that the increase in rainfall amount could bring the increase in drip rate of drip water, and then the decrease in interaction between solution and karst, and finally the DCF decrease in drip water. Accordingly, the reconstruction of precipitation could be performed using  $^{14}\text{C}$  variation in a speleothem formed by drip water with simple flow dynamics.

We measured  $^{14}\text{C}$  of a growing speleothem of ~7 cm in length from the Ryugashi Cave. The DCF of  $11.5\pm 0.3\%$  on the surface part of the speleothem was matched with the annual mean of DCF of  $12.2\pm 2.1\%$  in drip waters at the same site. The calibrated age of the speleothem was calculated by comparing the  $^{14}\text{C}$  with the IntCal13 calibration curve. The DCF-corrected  $^{14}\text{C}$  generally matched well with the IntCal  $^{14}\text{C}$  calibration curve, and it suggests that DCF in the speleothem was roughly constant through its growth time. However, some discrepancies were observed around ~1450 cal AD and ~1700 cal AD. The DCF-corrected  $^{14}\text{C}$  in the speleothem was lower than the IntCal  $^{14}\text{C}$  in the two periods, indicating the precipitation decrease around the Ryugashi Cave in the periods. We will examine reconstruction of precipitation in central Japan using the other speleothems from the Ryugashi Cave.

[1] Minami et al. (2015) NIMB 362, 202-209.