

Rainfall fluctuation recorded in a stalagmite from West Java, Indonesia

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In order to assess the reliability of stable isotopic ratios of stalagmites as climate proxies, we performed the first systematic comparison between temporal variation in precipitation and those in stable isotopic ratios of a speleothem, by taking the travel time of groundwater into account. We analyzed a stalagmite collected in Ciawitali Cave, West Java, Indonesia, and found that the number of growth bands is coincident with the uranium series disequilibrium age within the error. This is the first documentation of a stalagmite having annual bands in the Asian equatorial region. Furthermore, annual variations of isotopic data (i.e., $\Delta 18\text{O}$ and 13C) were compared with that of precipitation since 1950, showing significant, negative correlations if the correction is not made for the travel time. This result suggests that stable isotopic ratios in stalagmites are applicable as effective proxies for ancient precipitation in the study area.