Constraining the Fantangisña serpentinite mud volcano (Mariana Forearc) episodicity using calcareous nannofossils

Deborah Tangunan
University of Salamanca, Department of Geology, 37008 Salamanca, Spain; University of Bremen, Department of Geosciences, 28359 Bremen, Germany; tangunan@uni-bremen.de
Walter Menapace
University of Bremen, MARUM – Center for Marine Environmental Sciences and Department of Geosciences, 28359 Bremen, Germany; menapace@uni-bremen.de

In 2016, sediments were collected during IODP Expedition 366 from the Mariana Convergent Margin and analysed to address key questions regarding the age and episodicity of the eruption of the Fantangisña serpentinite mud volcano (SMV), one of three mud volcanoes (MVs) in the Mariana Forearc. Here, we used the calcareous nannofossils in the pelagic sediments collected from the MV summit and flank to estimate the age of the MV edifice, supplementing this with planktonic foraminifera in some coarse-grained intervals. Because of their deep origin, most of the MV sediments were barren of nannofossils, although some contained rare to very rare, poorly-preserved specimens, hence making them unreliable biostratigraphic markers. On the other hand, the pelagic sediments draping the MV or beneath the edifice contained abundant, well-preserved nannofossils, and thus provided a rather precise age estimate. Results from this study show that the biostratigraphic age of the Fantangisña SMV can be well constrained. The pelagic cover on top of the serpentinite mudflows yielded an age of ~0.44 Ma (Late Pleistocene), marked by the top of *Pseudoemiliania lacunosa*. The forearc sediments were dated at ~11.21 Ma (Late Miocene), based on the last occurrence of *Calcidiscus premacintyrei*. This indicates that the timespan for the build-up of the entire Fantangisña edifice at the Mariana Forearc is ~10.77 Myr, and was consequently actively erupting mud up until ~0.44 Myr ago. The occurrence of reworked Late Oligocene to Early Miocene nannofossil taxa (*Triquetrorhabdulus carinatus* and *Reticulofenestra bisecta*) in the investigated samples from the flanks of the SMV also suggests the presence of older pelagic sediments in the Mariana Forearc region.