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## Micropaleontological proxies as tool to date serpentinite mud volcanisms and seamount subduction and to reconstruct paleoenvironmental conditions in the Mariana convergent margin system (IODP Expedition 366)

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The Mariana forearc system represents the only known currently active serpentine mud volcanism in a convergent margin setting. Here, International Ocean Discovery Program (IODP) Expedition 366 recovered material from three serpentinite mud volcanoes at increasing distances from the Mariana trench subduction zone along a south-to-north transect: Yinazao (Blue Moon), Fantangisña (Celestial), and Asùt Tesoru (Big Blue). Cores contain serpentinite mud with lithic clasts from the subducting Pacific Plate, forearc crust and mantle. Furthermore, at almost all drilled sites, a thin cover of pelagic sediment containing planktic and benthic foraminifera, calcareous nannofossils, radiolaria and sponge spicules was recovered, constraining the most recent mud volcano activity. The base of the seamounts overlies pelagic sediment and volcanic ash/tephra layers which establish a maximum age for the mud activity. Additionally, separate serpentinite mud flows are intercalated by distinct sedimentary layers.

Integrated biostratigraphy, based on planktonic foraminifera and calcareous nannofossils, is used to assess the minimum and maximum age of mud flow activity and of the distinct sedimentary layers and serpentinite mud flow layers. Biostratigraphic information will also provide time indications on lower plate dehydration and serpentinization of the forearc wedge. Preliminary results from Fantangisña seamount (Site U1497 and U1498) reveal the existence of biostratigraphic marker species for both planktonic foraminifera and calcareous nannofossils. Specifically, the presence of *Globigerinella calida*, *Globorotalia flexuosa*, *Globorotalia truncatulinoides*, *Globorotalia tumida*, *Sphaeroidinella dehiscens* (amongst planktic foraminifera) and *Gephyrocapsa* spp., *Pseudoemiliana lacunosa*, *Reticulofenestra asanoi*, *Discoaster deflandrei*, *Discoaster variabilis* (amongst calcareous nannofossils) allow a possible age assessment from Late Pleistocene to Late Miocene.

Planktonic assemblages are dominated by (sub)tropical *Globigerinoides* forms such as *G. conglobatus*, *G. ruber*, *G. elongatus*, *G. sacculifer*, *G. trilobus*. Other common (sub)tropical

species detected are *G. menardii*, and *O. universa*, whereas *G. siphonifera*, *N. dutertrei*, *S. dehiscens* and *P. obliquiloculata* are less common.

Benthic foraminifera are less abundant but show high diversity. Forms of *Lagena*, *Cibicidoides*, *Fissurina*, *Ehrenbergina*, *Gyroidina*, *Melonis*, *Pullenia*, *Osangularia*, *Favulina*, *Reophax*, *Rhabdammina*, *Saccorhiza*, and *Hormosinella* are present. To the best of our knowledge, the occurrence of benthic forms in such environments is highly unusual and has not been recorded in detail so far.

Quantitative and statistical analyses on foraminifera assemblages will provide information on water column and bottom water conditions. Moreover, a detailed comparison between assemblages pre- and post-volcanism may reflect possible changes in the ecological conditions.

Collected data will not only allow to constrain in time the evolution of submarine volcanoes in the Mariana convergent system but also to investigate foraminifera ecology in such an extreme environment.