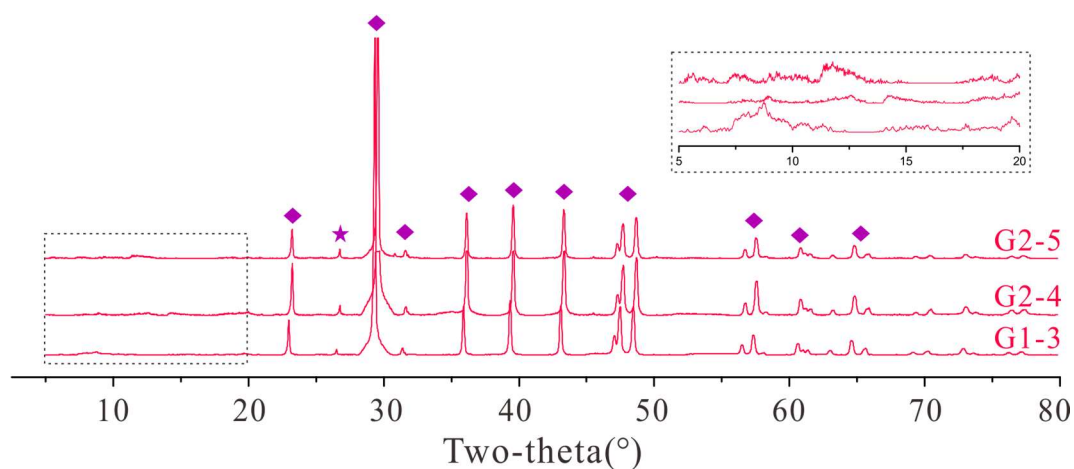


**Figure S1.** Geomorphology of the southeast slope of the Zhaoshu plateau along the dive track. Numbers at the lower left of each panel indicate water depth. (A) Deimatidae on deep-sea sediments. (B) Fractured volcanic rocks deeper in the water where sediments can be observed. (C) Pillow lava outcrop at the steeper area where few sediments developed. (D) Dense reef carbonates like concrete at the top of the plateau.



**Figure S2.** X-ray powder diffraction diagram of carbonate samples showing the composition main mineral phases. Calcite (rhombus) dominated among all samples. Main patterns of quartz (pentangle) were also recognized. Enlarged view show the manganic mineral features in bulk samples.