

Geoscientific Setting and Educational Significances of Yonaguni Island in the Ryukyu Arc, Eastern Asia

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The Ryukyu Arc lies along the subduction zone between Eurasia and Philippine Sea Plates. Yonaguni Island is located in southwesternmost of the Ryukyu Arc, where geological setting connects the Taiwan central range and the Luzon volcanic arc. Miocene sandstone (Yaeyama group) is broadly exposed on island surface which forms low altitude mountains and hills (maximum elevation is 231 m). The Yaeyama Group, of which sandstones show some distinct physical sedimentary structures, such as hummocky or ripple cross-stratification, suggesting deposition in shallow-marine to marginal-marine settings, is characterized by pervasive occurrences of well-preserved trace fossils. Sandstone surfaces in wave-splash zone often show a honeycomb structure (tafoni) indicating physical disintegration by salt weathering under present coastal environments with strong wind. This honeycomb geometry seems to be controlled by the horizontal and vertical distances from coast line and sea level. Pleistocene limestone (Ryukyu group) partly covers the Yaeyama group and forms uplifted marine terraces made mainly from coral reef sediments. As the permeable limestones of Ryukyu Group broadly covers the less permeable Yaeyama Group, a number of natural springs rise at the bottom of the precipitous limestone cliffs, and provide water resources and scenic landscapes. Such stratigraphical, paleontological, geomorphological and hydrological features present significant sites to study seamless geoscience. Geoscientist should discuss scientific significances for conservation of several geosites in Yonaguni Island.

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