Microfabric Analysis of Cyclic Rhythmites—a Comparison of Modern and Ancient Samples

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A cyclic rhythmite is represented by alternating silt-rich and clay-rich laminae, which can be used to interpret original depositional environments. This research on cyclic rhythmites compares fabric features of sediment from modern tidal environments with possible ancient analogs in order to determine the depositional conditions of the ancient samples. Samples from both modern and ancient cyclic rhythmites were collected and prepared for study at the macroscopic and microscopic level. Layer thickness, components of layers, and fabric features were studied using hand samples, thin-section analyses, and the scanning electron microscope.

The study of the samples helped in the determination of depositional processes and the variations that operated within the environments. A number of factors, other than tides, such as climate, season, or varying influx of material through time from river systems, have been considered to be influential in the formation of these rhythmites. This research has helped determine how these may have played roles in the rhythmite formation. Examining the rhythmite laminae at different scales allows the layering observed megascopically in hand samples to be related to microscopic clay fabric that was sensitive to environmental depositional controls. This study characterizes the features of fabric representative of rhythmite sediments and rocks and uses these features in identifying sedimentary processes operative in the original depositional environment.

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