

## **Hot-Water Deposition of Pyritic Stromatolite and Its Relation to Biomineralization**

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Pyritic stromatolite aggregation, a rich pyrite ore, scatters as reef masses in the SEDEX deposits of the Proterozoic Yanshan rift trough. The pyritic stromatolite consists of a core and alternating concentric rims of light colloidal pyrite and dark organic materials. The concentric rims are cemented mutually by trichomes highly similar with the trichomic microorganisms inhabiting substantively around the black chimneys on the current seabeds while the core is composed chiefly of groups of thermophilous sulfur bacteria. Biomarkers for the molecules of pyritic stromatolite include pristane, phytane, regular isoprenoids paraffin, methyl-heptadecyl, and so on. This study reveals the existence of methane-yielding bacteria in the pyritic stromatolite and reflects the evolution of the thermophilous thallophyta.

Long pulsation of mineralizing thermal solutions venting up along contemporaneous faults in rift troughs contributed greatly not just to the reproduction of thermophilous organisms living around the vents but to their adsorption of  $\text{Fe}^{2+}$  from the solutions, in a reducing environment. Pyritic stromatolite constantly took shape through metabolism and reduction of these organisms. Owing to the uneven development of the organic communities close to the vents or the hydrothermal plumes, pyritic stromatolite occurred eventually as scattering reef masses. This mineralizing mechanism may be summarized as these: firstly, hydrothermal flowing associated with submarine exhalation, then, adsorption

and metabolism of thermophilous microorganisms, reduction of organic materials, and finally, formation of the deposits of pyritic stromatolite.