

## Effects of hydrostatic pressure on methanogenesis in the subsurface sediments of South China Sea

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Hydrostatic pressure is regarded as an important parameter influencing the distribution and metabolism of microbial life in the ocean[1]. High pressure is found to have influences on the activity of microbial degradation of organic matter[2]. However, the extent of high pressure on microbial diversity and activity, such as on specific metabolic processes, is poorly analyzed and understood. This study is designed to test if hydrostatic pressure an important factor controlling / influencing the diversity and metabolic types of methanogenesis in the subsurface sediments of South China Sea (SCS).

Sediment samples were collected at Site U1433 during Integrated Ocean Drilling Program Expedition 349. Sediment samples from three different depth: 90-190mbsf (meters below sea floor) □ U1433-A □ □ 450-550mbsf □ U1433-B □ □ and 700-750mbsf (U1433-C) were enriched with three substrates (Acetate, methanol, H<sub>2</sub> and CO<sub>2</sub>) at in situ temperatures (15°C, 32°C, 60°C), respectively. At different phases of incubation, methane was measured in the headspaces of the serum bottles. At atmospheric pressure, the samples from different depths showed different preference of substrate utilization to produce methane. In U1433-A, the enrichment with H<sub>2</sub>/CO<sub>2</sub> produced higher amount of methane in headspace than the other two enrichments; while the preferred substrate is methanol in U1433-B, and acetate in U1433-C, respectively. The enrichments at high hydrostatic pressure (40MPa) are still under investigation. The methanogenic archaeal communities and their changes under different pressures will be assayed by 16S rRNA gene and functional gene analysis.

[1] Marietou *et al.* (2014) *AEM* **80**, 5992-6003. [2] Leahy, J.G. *et al.* (1990) *Microbiological Reviews* **54**, 305-315.