

Abundance of deep subsurface microbial communities in the Tono area, central Japan

Takeshi Naganuma [1], Teruki Iwatsuki [2], Yuki Murakami [3]

[1] Appl. Biol. Sci., Hiroshima Univ., [2] JNC-TGC, [3] Biosphere Science, Hiroshima Univ.

<http://www.ipc.hiroshima-u.ac.jp/~hubol/index.html>

There are strong but circumstantial indications of microbial life widespread at depth in the crust of the Earth. We report the abundances of total and selected bacteria in the interstitial water of granite and sedimentary rocks in the Tono area, central Japan. Maximum abundance of 10^5 to 10^6 cells/ml was observed in the granite and sedimentary rock waters, respectively. Sulfate-reducing and iron-oxidizing/reducing bacteria were detected at depths having specific pH and oxidation/reduction potential (Eh). Those pH and Eh regimes were corresponding to the $\text{Fe}^{2+}/\text{Fe}^{3+}$ and $\text{H}_2\text{S}/\text{SO}_4^{2-}$ interface conditions. It is implied that these bacteria are involved in geochemical processes such as precipitation, dissolution and cycling of sulfur, iron, and related elements.