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PERENNIAL SPRINGS FROM THE CANADIAN ARTIC AS ANALOGUE SITES TO MARS

Abstract

Analogue sites permit researchers perform experiments, field tests and other studies in conditions similar to those present on extraterrestrial bodies. The Canadian artic has an extreme, harsh environment with settings similar to what some studies have suggest for Mars once. With an annual medium temperature of -19.7 C and down to -55 C and a geography and hydrology quite unique, the Canadian artic has not only great fidelity of the predicted conditions of the Martian "Snow Ball" Era but is also reasonably of easy access. The characteristics found on the higher zones of the Artic may help us not only comprehend how Mars may have looked once but also where and what techniques to use when looking for clues of past or present life. The Wolf spring located in the Axel Heiberg Island is of special interest for researchers because of the nature of its perennial springs, which flow through 400m to 600m of permafrost and are able to maintain a liquid phase due to their high salt content. It is of great interest for astrobiologists (especially biologists) because even under these cold, oligotrophic, micro-aerophilic conditions microorganisms are able to grow and maintain a steady population. The study of the mechanisms these microorganisms take advantage of has not only biotechnological applications but it may also help us design more appropriate study methods for remote detection of biosignatures. In this paper I review the characteristics that make the Canadian Artic, and specially the perennial springs of the Heiberg Island a fine choice for further astrobiology (principally microbiology focused) research.