



**Title of the seminary:**

**Pod skalista skóra na pustyni Atakama: ostatnie schronisko życia**

*Getting Under Atacama's Rocky Skin: Life's Last Refuge*



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**Abstract**

The last few decades have shown a surge of interest in the world of microorganisms that live in extreme environments. It can be argued that the combination of extreme conditions existing on the deserts present one of the most extreme environmental settings faced by microbial life. Microbial cells in extremely arid deserts need to withstand the severe biochemical stresses created by the lack of water, exposure to high levels of UV and photosynthetic active radiation, along with temperature fluctuations and/or high salinity. In this inhospitable environment, microbial life has found the refuge in very specific microhabitats - inside the rocks - within so called endolithic habitat. Endolithic colonization can be viewed as a stress avoidance strategy, where the architecture of habitable rocks provides efficient protection from incident lethal UV radiation, thermal buffering, and physical stability and first of all enhanced moisture availability. The study of the Atacama's extremophilic and extremotolerant microorganisms has therefore important implications for the understanding of the limits of life on Earth. Accordingly, our current interest in these microorganisms mainly centers on aspects derived from the fields of microbial ecology of polyextreme environments and biotechnological applications.

**Brief CV Jacek Wierzchos**

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Jacek Wierzchos is a Research Scientist at the National Museum of Natural Sciences (Spanish National Research Council). He earned a MSc in Chemistry and a PhD in Chemical Sciences at the Polish Academy of Sciences in 1990. J. Wierzchos



is an expert in geomicrobiology of microbial ecosystems in extremely arid environments and skilled for the use of electron and photon microscopy. J. Wierzchos is a co-author of a pioneer method to study extant or extinct microorganisms inside rocks. His current investigation lines can be summarized as: life, death, biomineralization and fossilization of lithobiontic microorganisms and their importance as biosignatures. These investigation lines develop ways to search the intracellular and extracellular secondary metabolites and provide us with a more solid background for speculations regarding the applicability of these biomolecules in biotechnology. J. Wierzchos is lead of the group that discovered several novel photosynthetic niches in the core of the Atacama Desert. Actually his major areas of interest are the studies of endolithic microbial communities, their adaptation to desert extreme environment, characterization of desert's habitable rocks architecture and identification of secondary metabolites with potential application in biotechnology.