

A photograph of a snowy Antarctic landscape. In the foreground, there is a vast, flat expanse of snow and ice. In the middle ground, a large, dark, jagged rock formation rises from the snow. The background shows a blue sky with scattered white clouds.

The Quest for Photosynthetic Microbes in Antarctica

By: Dr Mohd Firdaus Abdul Wahab

The effects of climate change is apparent all over the world. Extreme floods, droughts, snowstorms are just a few examples of never-before-seen events caused by global warming due to human activities. The major contributor is fossil fuel burning, releasing massive amounts of carbon into the atmosphere. Even extremely isolated and barely populated continent of Antarctica is highly affected. Signs of a warming planet can be seen from the melting of glaciers and the extent of sea ice during summer season. Even the “ozone hole” (region where the ozone layer is thinning) originally detected above the Antarctic region in the 1970s, is growing larger and larger year by year. Scientific evidence suggest the relationship between greenhouse gas emission and ozone depletion.



Photo credit: NASA



Photo credit: DeVos



Photo credit: tom jervis

UTM's Environmental Biotechnology Research Group (EnVBiotech) is a research group headed by Assoc. Prof. Dr. Zaharah Ibrahim, with 13 researchers as its permanent members. Founded in 2009, the group has now become one of the leading research groups under UTM Antarctica Research Group. EnVBiotech is on a quest to discover photosynthetic microbes from colder climates. These microbes will be used for the reduction of greenhouse gases in the tropics, because exposure to climate change could cause the Antarctic microbes to potentially possess the abilities that can be used in a variety of useful applications, especially with regard to the reduction of greenhouse gases. This can be done when these microbes convert greenhouse gases to less harmful substances, or products that have added value.

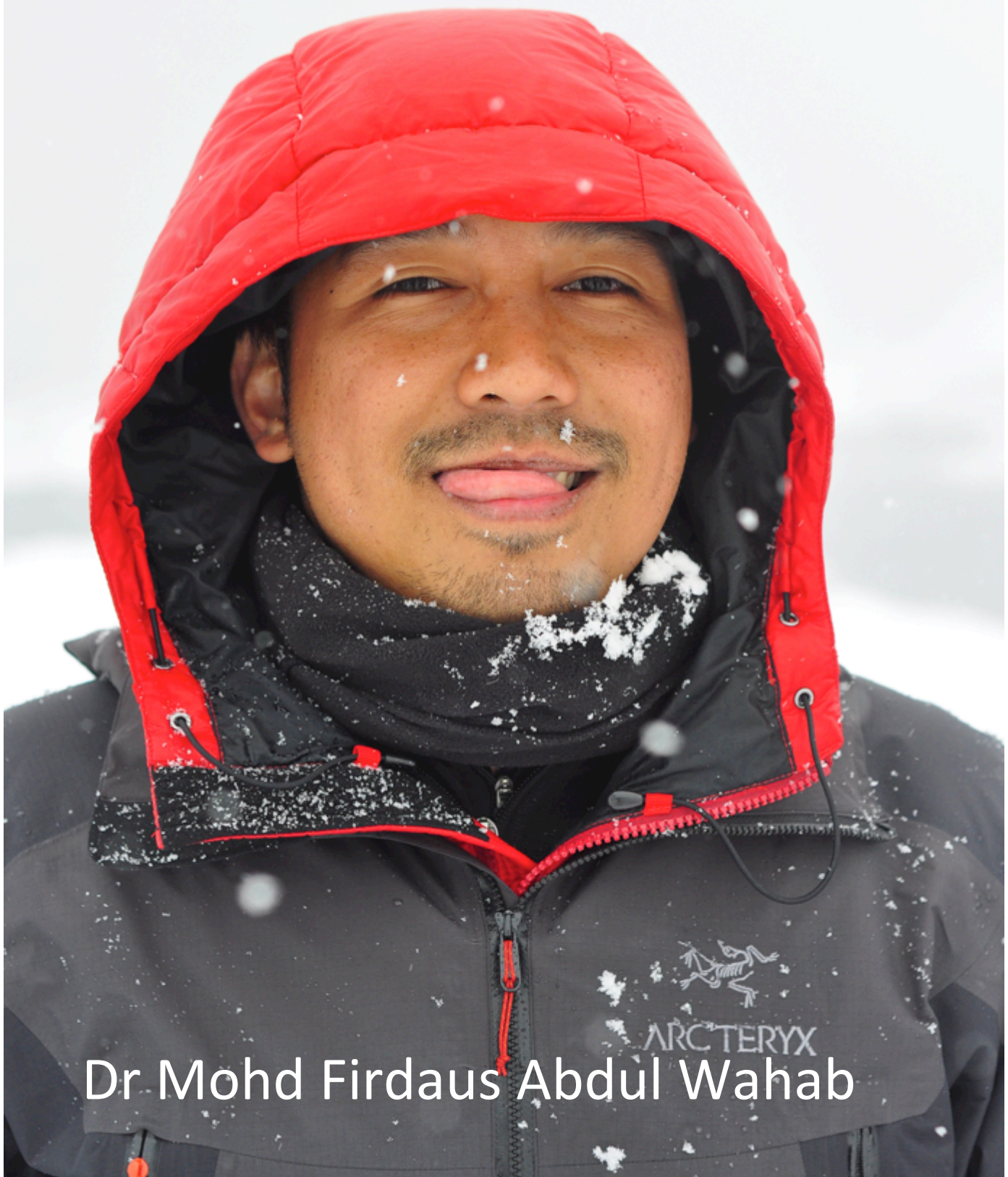
EnVBiotech

Carrying the EnvBiotech's flag was Dr. Mohd Firdaus Abdul Wahab. The aim was to collect samples of Antarctic sea water, sediment in coastal areas, soil, and ice/snow. Cold conditions, slippery rocks, hardly-accessible soil, all posed great challenges for the sampling process. Soil and sediment samples were stored in a sterilized sample bags, while water and ice/snow samples were stored in a water-tight sterilized container. These samples were then kept in cooler box, before being shipped to EnVBiotech labs, from Chile.



Photo credit: UTM Antarctica Research Group

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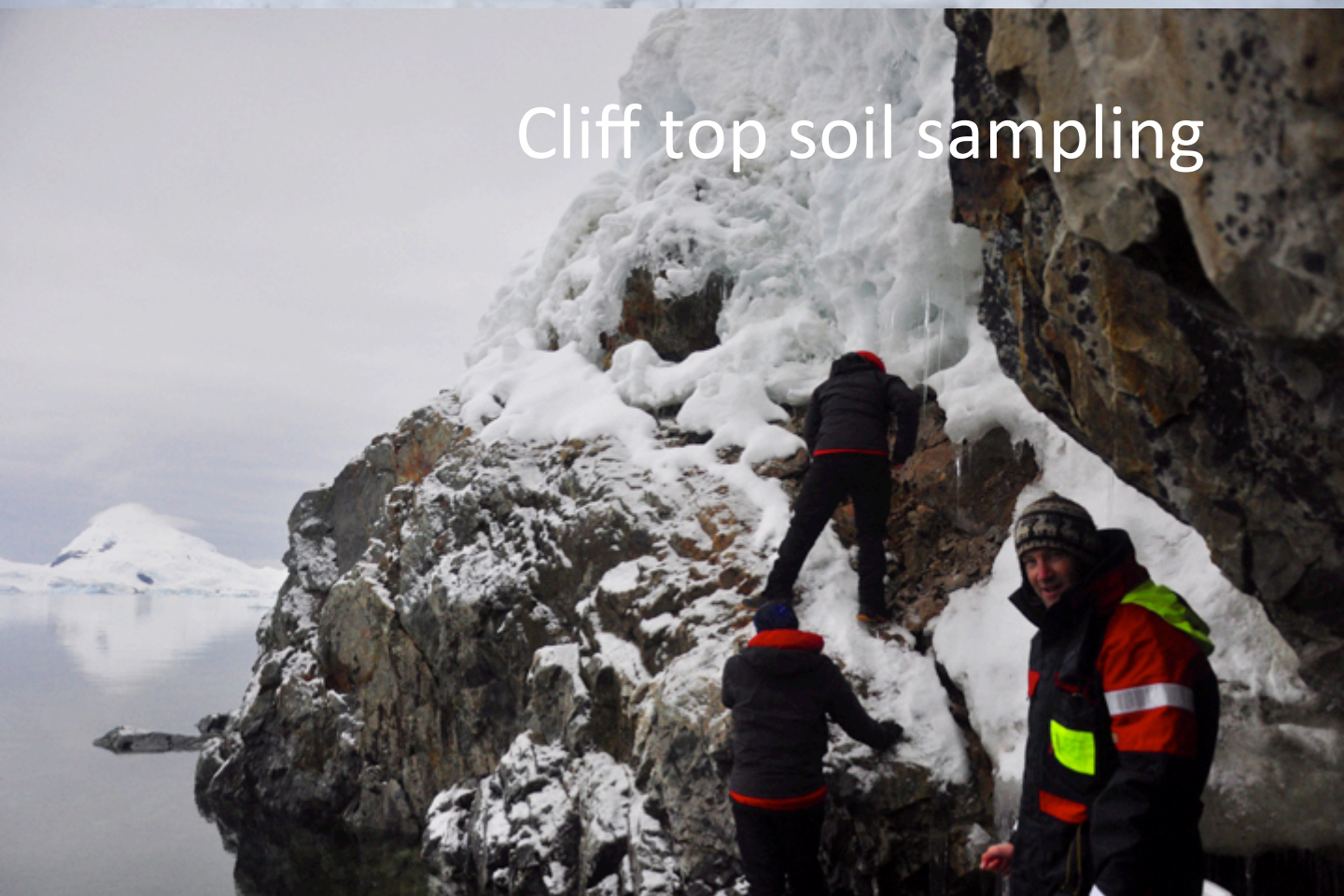


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At first sampling point



Cliff top soil sampling

Snow-covered soil sampling



Coastal sediment sampling

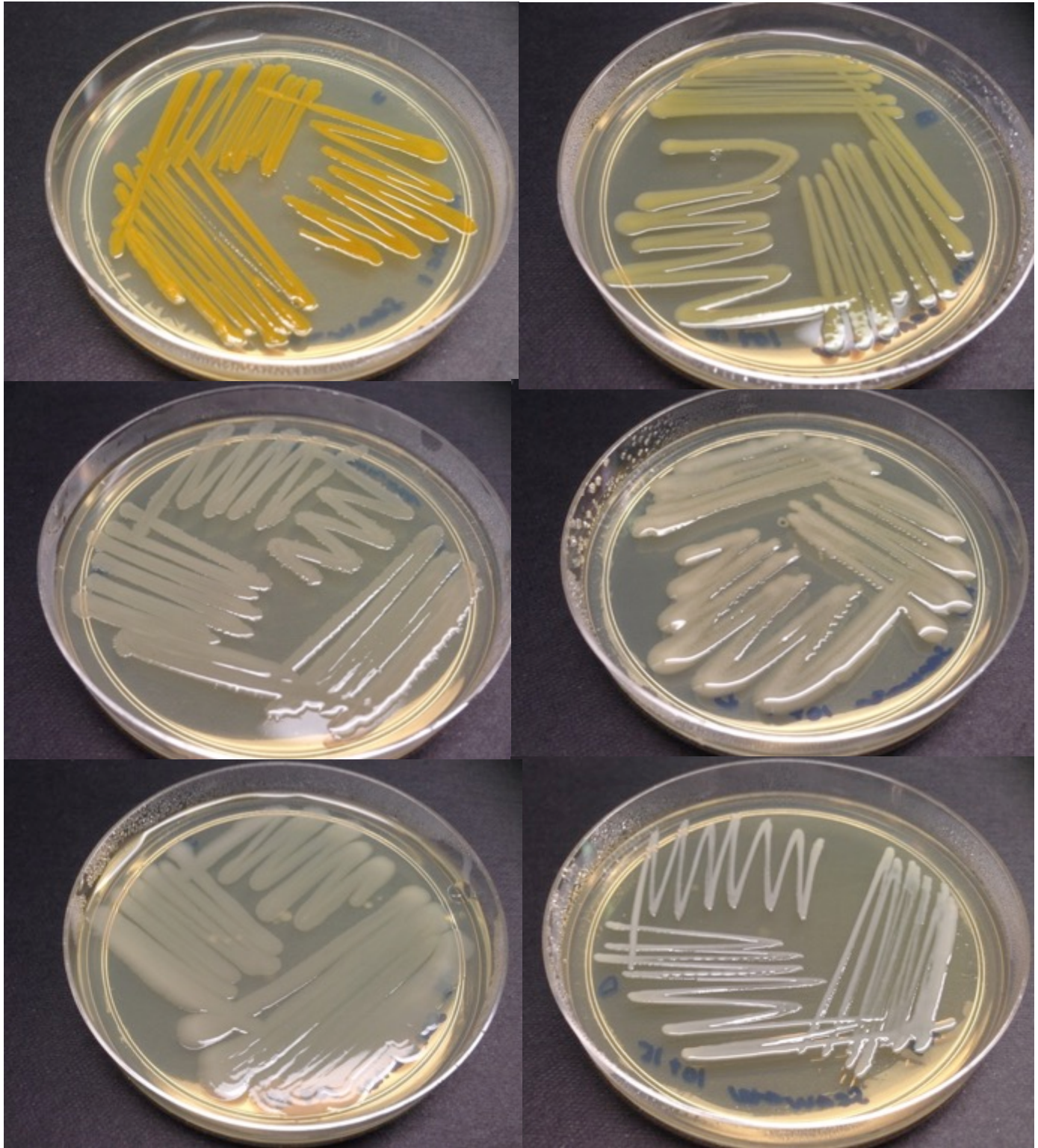


Soil sampling on Cuverville Island (Penguin Island)



Photo credit: UTM Antarctica Research Group

In the EnvBiotech labs, these samples are currently being analyzed for the presence of photosynthetic microorganisms. Photosynthetic microorganisms are capable of using light as their energy source. These microbes have the potential to be used in many applications in the tropics, such as in bioremediation (removal of contaminants from the environment), and industrial processes.



Photosynthetic bacteria from Antarctic environment

Photo credit: EnVBiotech



Photo credit: EnVBiotech

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