**Global Warming: Beyond the Polar Bears**

Global warming has been a hot topic in today’s society; no pun intended. If the Earth continues to warm at the current rate, life in all forms will change drastically, (Root et al. 2003). Only a few consequences of global warming are given significant media attention. However, scientists are preforming more research regarding outcomes that may not be as eye-catching. Dr. Mostafa Elshahed is a research microbiologist who is a professor at Oklahoma State University. In his research paper, “Effect of warming and drought on grassland microbial communities,” he discusses the effects of global warming on the soil microbiome, which is defined as all of the microorganisms including bacteria, archaea, and fungi that habitat the soil. Dr. Elshahed became a microbiologist after making a career change. “I worked as a pharmacist for two years and then I got bored to death, so I decided to go back to research and microbiology was one of the subjects I liked as an undergrad. I started looking at different fields of microbiology and taking different courses and I really liked the field of microdiversity and the discovery of new microbes.”

The soil is not something that comes to mind when one first thinks of global warming, but its importance is undeniable. When asked what drew him to the study of the effects of global warming on soil microbes, Dr. Elshahed said, “You can think of soil as a living organism. It has so many important functions. Of course it is a source of food, it plays an important role in the carbon cycle by fixing carbon from carbon dioxide to organic carbon, the nitrogen cycle, in fixing nitrogen to be used by other organisms, and most of these activities are mediated by microorganisms, many of which are in the soil or in the ocean.” Realistically, a change in temperature would not wipe out all microorganisms entirely. There are so many different types that are able to grow in almost any earthly environment imaginable, such as in deep-sea thermal vents or in the most barren deserts (Konings et al. 2002). Global warming would decrease the diversity of microorganisms present in soil. Dr. Elshahed emphasizes the importance of diversity and the robustness it gives an ecosystem, saying, “The more different types of microorganisms that you have in an ecosystem that are able to do something, the better the ability of the ecosystem to preform its function regardless of changes in temperature, water availability, or any other changing factors.”

Dr. Elshahed currently focuses much of his research on the discovery of new phyla. He thinks that it is important to have scientists continue working on this subject because, “Microbes are so diverse, and each type of microorganism has different types of genes and abilities from their genomes. You can think of it as a never-ending seed of biological diversity. If you want to look at new antimicrobials, new anti-cancer drugs, or new any type of biological compounds, there is a very good chance you will find these in microorganisms and there is an endless supply of new microorganisms, which is not the case with mammals.” He is currently working on new techniques and technology to allow the genomes of microbes to be sequenced directly from the environment. Currently, to sequence genomes, the microbes need to be collected and cultured in lab before going through the process of sequencing the genome, (Himmelreich et al. 1996).

As the world is changing, there is added need for science. We need to see how our environment will change as an effect of global warming, or any other changes. There is still so much to be discovered, particularly in the field of microbiology. The depths of diversity have not been reached. There are solutions and insights that only research can give us, and lots of new exciting progress as we collectively discover more about the world we live in.

References:

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