Theme 10: Impact of climate change on wetlands

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HEAVY METAL TOLERANCE PATTERNS OF TOTAL HETEROTROPHIC BACTERIA ISOLATED FROM THE SOILS OF MAHATMA GANDHI UNIVERSITY CAMPUS, KOTTAYAM, KERALA

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Heavy metals are often defined as a group of metals whose atomic density is greater than 5 g/cm. Some of the heavy metals are essential and are required by the organisms as micro nutrients and are known as 'trace elements, while some other heavy metals have no biological role and are harmful to the organisms even at very low concentration. Due to the selective pressure from the metal in the growth environment, microorganisms have evolved various mechanisms to resist the heavy metal stress. At present the tolerance of soil bacteria to heavy metals has been proposed as an indicator of the potential toxicity of heavy metals to other forms of biota. In the present work, an attempt was made to study the metal resistance patterns of total heterotrophic bacteria isolated from the soils of Mahatma Gandhi University campus. A total of 46 bacterial strains were isolated from different locations of the campus and tested for their resistant to 5 common metals in use (lead, zinc, copper, cadmium and nickel) by agar dilution method. The results of the present study revealed that most of the isolates showed resistance to one or more heavy metals selected. Tolerance to lead was comparatively high followed by zinc, nickel, copper and cadmium. About 33% of the isolates showed very high tolerance (>4000µg/ml) to lead. Tolerance to cadmium was rather low (<100 µg/ml). Resistance to zinc was in between 100µg/ml - 1000µg/ml and most of the isolates shows resistance in between 200-500 µg/ml. Resistance to Nickel was in between 100µg/ml - 1000µg/ml and the majority of them shows resistance in the range 300µg/ml - 400µg/ml. Resistance to copper was in between 100µg/ml - 500µg/ml and a good number of them showed resistance in between 300µg/ml - 400µg/ml. Therefore, from the results of this study, it is concluded that heavy metal-resistant bacteria are widely distributed in the soils of MG university campus and the tolerance of heavy metals varied among bacteria even though they were isolated from the same soil.