

*Editorial***Methods and special applications in bacterial ecology****Ijeh I I ***

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EDITORIAL NOTE

Bacteriology is the study of bacteria and their relation to medicine. Bacteriology evolved from physicians needing to apply the germ theory to test the concerns relating to the spoilage of foods and wines in the 19th century. Identification and characterizing of bacteria being associated to diseases led to advances in pathogenic bacteriology. Koch's postulates played a role into identifying the relationships between bacteria and specific diseases. Since then, bacteriology has had many successful advances like effective vaccines, for example, diphtheria toxoid and tetanus toxoid.

There have also been some vaccines that were not as effective and have side effects for example, typhoid vaccine. Bacteriology has also provided discovery of nearly all animal life is dependent on bacteria for survival as only bacteria and some archaea possess the genes and enzymes necessary to synthesize vitamin B12, also known as cobalamin, and provide it through the food chain. Vitamin B12 is a water-soluble vitamin that is involved in the metabolism of every cell of the human body. It is a cofactor in DNA synthesis, and in both fatty acid and amino acid metabolism. It is particularly important in the normal functioning of the nervous system via its role in the synthesis of myelin. There are typically 40 million bacterial cells in a gram of soil and a million bacterial cells in a millilitre of fresh water. There are approximately 5×10^{30} bacteria on Earth, forming a biomass which is only exceeded by plants. Bacteria are vital in many stages of the nutrient cycle by recycling nutrients such as the fixation of nitrogen from the atmosphere. The nutrient cycle includes the decomposition of dead bodies; bacteria are responsible for the putrefaction stage in this process. In the biological communities surrounding

hydrothermal vents and cold seeps, extremophile bacteria provide the nutrients needed to sustain life by converting dissolved compounds, such as hydrogen sulphide and methane, to energy.

The discovery of the connection of microorganisms to disease can be dated back to the nineteenth century, when German physician Robert Koch introduced the science of microorganisms to the medical field. He identified bacteria as the cause of infectious diseases and process of fermentation in diseases. French scientist Louis Pasteur developed techniques to produce vaccines. Both Koch and Pasteur played a role in improving antiseptics in medical treatment. This had an enormous positive effect on public health and gave a better understanding of the body and diseases. In 1870-1885 the modern methods of bacteriology technique were introduced by the use of stains and by the method of separating mixtures of organisms on plates of nutrient media. Between 1880 and 1881 Pasteur produced two successful vaccinations for animals against diseases caused by bacteria and it was successful. The importance of bacteria was recognized as it led to a study of disease prevention and treatment of diseases by vaccines. Bacteriology has developed and can be studied in agriculture, marine biology, water pollution, bacterial genetics and biotechnology.

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