Journal of
Microbial & Biochemical Technology

OPEN ACCESS Freely available online

Perspective

Seperation of Bacteria from Soil

Evelyn Joy*

Department of Microbiology, Haramaya University, Ethiopia

ABSTRACT

Bacteria are tiny, one-celled organisms – generally 4/100,000 of an inch wide (1 μm) and somewhat longer in length. What bacteria lack in size, they make up in numbers. A teaspoon of productive soil generally contains between 100 million and 1 billion bacteria. That is as much mass as two cows per acre. A ton of microscopic bacteria may be active in each acre of soil. Bacteria fall into four functional groups. Most are decomposers that consume simple carbon compounds, such as root exudates and fresh plant litter. By this process, bacteria convert energy in soil organic matter into forms useful to the rest of the organisms in the soil food web. A number of decomposers can break down pesticides and pollutants in soil. Decomposers are especially important in immobilizing, or retaining, nutrients in their cells, thus preventing the loss of nutrients, such as nitrogen, from the rooting zone

INTRODUCTION

Bacteria were released and separated from soil by a simple blending-centrifugation procedure. The percent yield of bacterial cells (microscopic counts) in the supernatants varied over a wide range depending on the soil type. The superantants contained large amounts of noncellular organic material and clay particles. Further purification of the bacterial cells was obtained by centrifugation in density gradients, whereby the clay particles and part of the organic materials sedimented. A large proportion of the bacteria also sedimented through the density gradient, showing that they had a buoyant density above 1.2 g/ml. Attachment to clay minerals and humic material may account for this apparently high buoyant density. The percent yield of cells was negatively correlated with the clay content of the soils, whereas the purity was positively correlated with it. The cell size distribution and the relative frequency of colony-forming cells were similar in the soil homogenate, the supernatants after blending-centrifugation, and the purified bacterial fraction. In purified bacterial fraction from a clay loam, the microscopically measured biomass could account for 20 to 25% of the total C and 30 to 40% of the total N as cellular C and N. The amount of cellular C and N may be higher, however, owing to an underestimation of the cell diameter during fluorescence. A part of the contamination could be ascribed to extracellular structures as well as partly decayed cells, which were not revealed by fluorescence microscopy. In microbial systems, the scale at which individuals interact is related to the distance over which they can effect changes in the concentration of gases or solutes This may vary depending on the gas or solute and the concentration at which it has an effect on bacterial physiology, however, two notable studies have suggested that the vast majority of interactions occur within 20 μm of bacterial cells studies on microbial systems (whether they focus on microbial activity or diversity) are generally carried out at scales many orders of magnitude larger than those at which microorganisms interact with other organisms or with their surrounding environment.

CONCLUSION

Soil bacteria transform atmospheric N2 into ammonia and are central to soil and plant health. They play a pivotal role in cycling of nutrients within the soil. The soil contains numerous genera of bacteria, many of which not only have important roles in nutrient cycling but also protect crops against diseases. Plant growth promoting rhizobacteria (PGPR) benefit the growth and development of plants directly and indirectly through several mechanisms. The production of secondary metabolites i.e. plant growth substances, changes root morphology resulting in greater root surface area for the uptake of nutrients, siderophores production, antagonism to soil-borne root pathogens, phosphate solubilization, and di-nitrogen fixation. The root surface area for uptake of nutrients and production of PGPR may help to optimize nutrient cycling in the event of stresses due to unsuitable weather or soil conditions.

***Corresponding author:** Evelyn Joy, Haramaya University, Po. Box. 138 Dire Dawa, Ethiopia.

Received: February 10, 2021; **Accepted:** February 17, 2019, 2021; **Published:** February 24, 2021

Citation: Aron(2021) Seperation of Bacteria from Soil. J Microb Biochem Technol. 13:456 Doi: 10.35248/1948-5948.21.13.456