ISSN: 2155-9597
Journal of Bacteriology & Parasitology

OPEN ACCESS Freely available online

Opinion Article

Diversity and Abundance of Culturable Nitrogen-Fixing Bacteria

Markus Maria*

Department of Biochemistry, University of Francis Crick, London, UK

DESCRIPTION

Nitrogen-fixing bacteria, microorganisms that can convert atmospheric nitrogen into fixed nitrogen, which is an inorganic compound can be used by plants. Over 90% of all nitrogen fixations are affected by these organisms and play an important role in the nitrogen cycle. Two types of nitrogen-fixing bacteria are recognized. The first types of free-living also known as non-symbiotic bacteria, includes the cyanobacteria or blue-green algae anabaena and nostoc, as well as the genus *Azotobacter*, *Beigelinkia* and *Clostridium*. The second type includes reciprocal or symbiotic bacteria. An example of reciprocal bacteria is *Rhizobium*, which is associated with legumes such as various members of the pea family. Frankia associated with a particular dicotyledon (actinorhiza plant); a particular *Azospirillum* species associated with cereal grass.

Nitrogen-fixing bacteria form small growths, called nodules, in legumes. Bacteria fix nitrogen in plant tubers, resulting in symbiotic nitrogen fixation. Nojurin protein is produced by plants for this symbiotic nitrogen fixation. These nojurin proteins are involved in growth development and root modular metabolism. The nozulin protein is similar to the nodrin 26 protein, which is an essential and important part of the Symbiosome Membrane (SM) protein. Symbiosome membrane is responsible for most metabolic and transport functions.

Nodulin Intrinsic Proteins (NIP) is sensitive to osmotic stresses such as drought and salt stress and is essential for plant water balance. The increased phosphorylation of NIP by salt represents the role of NIP in plant stress. Another important function of NIP is the transport of useful and toxic metal molecules.

Symbiotic nitrogen-fixing bacteria invade the root hairs of host plants, where they multiply and stimulate nodule formation, plant cell expansion, and closely related bacteria. Inside the tuber, the bacteria convert free nitrogen to ammonia, which the host plant uses for its development. To ensure proper nodule formation and optimal growth of legumes such as alfalfa, beans, clovers, pea, soybeans, etc., it is usually suitable for seeds, especially in poor soils or soils free of the necessary bacteria. Infuse a commercial culture of *Rhizobium* species.

Nitrogen-fixing bacteria such as *Vinelandii* and *Pneumoniae* fix only enough N_2 to meet their needs. Ammonia produced by N_2 fixation is rapidly metabolized and is not excreted in the medium. After these bacteria die, N_2 will eventually be available in plants. These bacteria do not synthesize nitrogenase if there is sufficient fixed N_2. Nitrogenase seems to be a tightly regulated system.

The growth of all living organisms depends on the availability of mineral nutrients, and nothing is more important than nitrogen, which is needed in large quantities as an essential component of proteins, nucleic acids, and other cellular components. Nitrogen is abundant in the earth's atmosphere, with almost 79% in the form of N_2 gas. However, N_2 is not available to most organisms due to the triple bond between the two nitrogen atoms, leaving the molecule almost inactive. To use nitrogen for growth, it must be "fixed" (bonded) in the form of ammonium (NH_4) or nitrate (NO_3) ions. Rock weathering releases these ions very slowly, so the impact on the availability of fixed nitrogen is negligible. Therefore, nitrogen is often a limiting factor for growth and biomass production in all environments where life-sustaining climate and water availability are available.

Correspondence to: Markus Maria, Department of Biochemistry, University of Francis Crick, London, UK, E-mail: mariaamarkus@charite.uk

Received: 08-Mar-2022, Manuscript No. JBP-22-16632; **Editor assigned:** 11-Mar-2022, PreQC No. JBP-22-16632 (PQ); **Reviewed:** 25-Mar-2022, QC No. JBP-22-16632; **Revised:** 04-Apr-2022, Manuscript No. JBP-22-16632 (R); **Published:** 11-Apr-2022, DOI: 10.35248/2155-9597.22.S15.008.

Citation: Markus M (2022) Diversity and Abundance of Culturable Nitrogen-Fixing Bacteria. J Bacteriol Parasitol. S15:008.