Article Side
The Nitrogen fixation by Seolncr

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For nitrogen fixation is the combination of molecular nitrogen or dinitrogen with oxygen or hydrogen to give oxides or ammonia that can be incorporated into the biosphere . Molecular nitrogen, which is the major component of the atmosphere is inert and does not directly usable by most living organisms. Nitrogen fixation can occur abiotically (without the intervention of living things) or by action of microorganisms (biological nitrogen fixation). The general setting is the incorporation into the biosphere of a significant amount of nitrogen that can be achieved globally about 250 million tons per year, of which 150 correspond to the biological fixation.

These reactions occur so abiotic natural conditions as a result of electric shock or processes of combustion and the water of rain is responsible for dragging down the compounds formed. Are also derived from the chemical synthesis industry conducted in fertilizer with a high consumption of energy .

The reduction of nitrogen to ammonia carried out by bacteria living outside or in symbiosis with some species vegetables (legumes and some woody non-legumes), is known as biological nitrogen fixation (BNF). Organisms capable of fixing nitrogen are called diazotrophs .

This property is restricted only to prokaryotes and is well distributed among the different groups of bacteria and some archaea . It is an energy intensive process that occurs through the mediation of the enzyme nitrogenase using the following equation:

Ammonia, the process first stable compound, is assimilated by fasteners or transferred to the corresponding free host in the case of association with plants. Although ammonia (NH 3) is the direct product of this reaction is quickly ionized ammonia (NH 4). In free-living diazotrophs, the nitrogenase ammonium is assimilated into glutamate through the synthesis cycle glutamine synthetase / glutamate.

The nitrogenase consists of two metalloproteins , molibdoferroproteÃ-na ferroprotein and is fairly well conserved in all fixing microorganisms. Presents a range of activities spread over molecules containing triple bonds which has created the basis for a practical method of detection and measurement of binding capacity, and to think about the possible role of this enzyme in detoxifying the primordial atmosphere of the earth.

In many bacteria, the nitrogenase is very susceptible to destruction by oxygen (many bacteria stop producing fixed nitrogen in the presence of oxygen). Low oxygen tensions are used by different bacteria that live in anaerobic , low oxygen breathing, or by obtaining oxygen with a protein (eg leghaemoglobin).

Nitrogen fixation has great economic and ecological interest. In fact, as an example, high yields of soybean worldwide are caused by this process through the application of microbial inoculant quality. It occurs in all habitats and balances the biogeochemical cycling of nitrogen for the biosphere to recover the lost by denitrification . Involvement in the plant symbiotic fixation so important in human and animal food such as legumes, and the possibility of extending this property to other plant species of interest setting , thereby eliminating the need for fertilizer nitrogen, has made ??the FBN a subject of intense research over the years.

symbiotic nitrogen fixation in legumes

The best known are the plants of the legume family (Fabaceae) as clover , alfalfa , soybeans , beans or beans, peas), which have nodules on their roots with bacteria symbiotic known as rhizobia , producing nitrogen compounds that help the plant to grow and compete with other plants. When the plant dies, the nitrogen helps to fertilize the soil . 1 is also believed that during the life of the plant also enriches the soil through root exudates, rich in nitrogen.

The vast majority of legumes have this association, but some genera like Styphnolobium not. The legume-bacteria association is usually very specific, although some bacterial species are capable of forming symbiosis with various legumes:

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