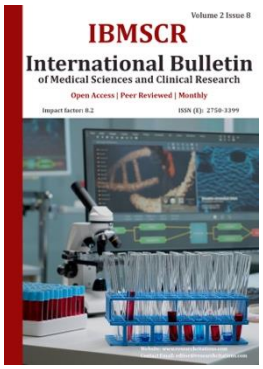

GROWTH AND REPRODUCTION OF MICROORGANISMS

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Abstract: Microorganisms grow and multiply like other living organisms. Growth refers to the multiplication of all chemicals, proteins, DNA, RNA, etc. For multicellular organisms, growth is usually an increase in the size of a single organism.Determined by growth, and in bacteria, on the contrary, their growth is determined by population growth or an increase in total mass. Microorganisms, i.e. bacteria, after they grow and reach a certain shape, they begin to divide, most of them divide in a simple, binary way. In bacteria, cell division is not just a means for the organism to make more bacteria, it is the only way that more bacteria can be added to the bacterial population and multiply.

Key words: Growth, DNA replication, nucleotide, peptidoglycan, asexual reproduction, generation time, lag phase, exponential growth phase, stationary growth phase, death or decline phase, viable bacteria, sexual reproduction, conjugation, genetics of microorganisms.

Introduction

After bacteria grow into a certain shape, they begin to divide and reproduce, most bacteria reproduce by binary i.e. simple division, the reproduction process initially involves cell elongation, begins with the division of the nucleotide into two Bacteria.

When a cell reproduces by simple division, a barrier usually appears in the middle of the cell and divides the cell into two. Normally, bacteria do not have chromosomes and a nucleus, but in bacteria, chromosomes are located in a special specialized part of the cell, and they contain nucleotides. or called a replicon. In bacteria, the reproduction process begins with the elongation of the cell, and this requires the expansion of the cell membrane and cell wall in addition to the increase in cell size.

Then the cell starts multiplying its DNA, and the process is called DNA replication. The DNA polymerase enzyme is involved in this process. DNA replication goes in the opposite direction at the same time and doubles over to the daughter cells. Daughter cells also have the same DNA sequence as the mother cell. The replication process continues until the entire chromosome is copied, resulting in the replication process occupying 80% of the time it takes for a bacterial cell to reproduce. After the newly formed chromosomes move to the opposite poles, the division of the cytoplasm, i.e. the process of cytokinesis, begins. In the process of cytokinesis, the membrane penetrates inside, as a result, it multiplies by forming a barrier in the middle of the cell. Only myxobacteria are an exception. They multiply in a different way, that is, by re-stretching like a thread without creating a special barrier. In real bacteria, the barrier is formed as a result of slow but not rapid development. It is a complex process. First, two layers of the cytoplasmic membrane grow on both sides of the cell, and peptidoglycan, i.e. murine layer, is synthesized between them. If a cell division barrier is formed near one of the cell ends, rods and small cells are formed in the culture. These cells go from rectangular to

oval to spherical. In the division of spherical bacteria, the sequential location of barriers is different. They can be formed sequentially in two or three planes that are perpendicular to one another. If the barriers are always located in one plane, a chain-like set of cells (streptococci), if the barriers are located in a row in two mutually perpendicular planes, tetracocci, and finally, if these obstacles are located in three mutually perpendicular planes, a pack of cells is formed. will beThis method of division is almost permanent and plays an important role in the systematics of spherical bacteria. In cylindrical bacteria, division barriers are usually located perpendicular to the long axis. Only in rare cases, in spirally twisted forms, for example (in spirochetes), such barriers are located along the long axis. If rod-shaped bacteria divide, two cells of the same size are formed. If the daughter cells are the same size, it is called heteromorphic division. Heteromorphic division is rarely observed only in old cultures of bacteria growing in nutrient medium. Both cells continue to live as separate bacteria. Microorganisms in short as a result of the growth and reproduction of bacteria. a colony is formed. That's why bacteria increase their number by progression, as a result, their population doubles in each generation. In addition, the rate of reproduction of bacteria depends on a number of conditions and can be very different. possible If all the necessary conditions are present, bacteria multiply very quickly. Cells can divide again every 20-30 minutes if the environment has the right nutrients and the right temperature for the growth of the species, the reaction of the medium is optimal, there is plenty of oxygen for aerobic bacteria, etc. Such rapid reproduction is of great biological significance for bacteria. Rapid reproduction affects the survival of this species on earth. Since bacteria do not have any protective devices, they should be killed quickly, but their rapid multiplication does not allow this. Naturally, with the onset of unfavorable conditions, a lot of them will be killed, but this bacterium has a the few cells that remain on the ground multiply quickly and form a huge mass of new cells as the conditions improve. These are spread back to other parts of the earth. The lack of food, the effect of harmful products in the metabolism, the temperature that is unfavorable for their development and their being food for various bottom organisms, etc. are factors that limit the overgrowth of bacteria. Now let's talk about the generation period of bacteria. There is a period of time when bacteria multiply at a rapid rate. This period is called the generation period. The generation period depends on the age, type, nutritional environment, composition and temperature of microorganisms. The generation period is the time it takes for a bacterial population to double. This period is not the same in all bacteria. It is very short for most bacteria, 20-60 minutes under optimal conditions, and perhaps 5-10 hours for pathogens in the body. Most bacteria automatically increase their numbers in a short period of time due to their short generation time. One of the most important factors for the growth and rapid reproduction of bacteria is the food environment. If the nutrient medium is sufficient, the bacteria divide and reproduce every 15-18 minutes. Nutrients slow down or stop the growth of bacteria. If the bacteria are planted in a freshly prepared nutrient medium, they will not multiply at first. This process includes several periods.

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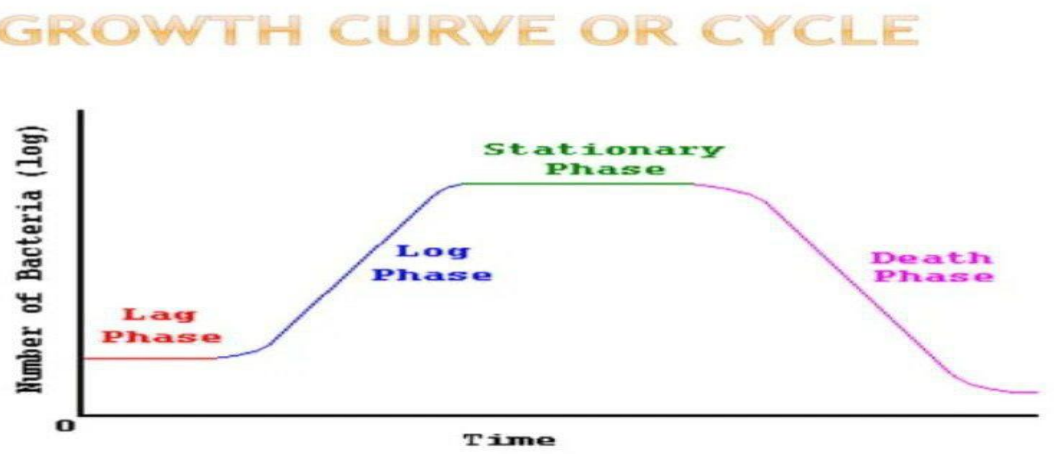
* Lag phase, i.e. the period of adaptation - if bacteria are absorbed into a newly prepared nutrient medium, they do not multiply for a certain period of time, the cells of the bacteria become active and only increase their cell size, the cells are saturated with water and the activity of enzymes increases. synthesizes enzymes necessary for cell division and population growth. This process lasts for 1-4 hours after the bacteria enter the nutrient medium.

*Logarithmic phase - reproduction goes at a high speed and the number of cells increases rapidly. This period is characterized by cell doubling. If growth is not limited, doubling will continue at a constant rate. Therefore, the number of cells in the population increases rapidly.

* Negative acceleration phase - during this period, cells are less active, because their generation time is extended, nutrients are reduced, and as a result, reproduction slows down.

* stationary phase - depending on the growth-limiting factor, it is mainly the reduction of nutrients and the formation of products such as organic acids. It is interesting that during this period, the growth rate and the death rate have the same value, that is, the yield the number of living and dead cells becomes equal. There is not enough space for living cells in the stationary phase, unless the growth rate is limited in this phase, the number of living cells will increase.

* death phase, in this phase, the number of dead cells is greater than the number of living cells, cells die at a constant rate, as a result, cells die at such a rate that in the end they all die, and in the following stages, bacteria regenerate themselves reproduction and growth gradually increase.



V.N. Shaposhnikov shows that the tanning process consists of two phases. In the first phase, the number of microorganisms increases, in the second phase, metabolic products increase and useful products accumulate in the substrate.

Recently, it has been believed that bacteria reproduce only by simple division, they do not have any complicated processes of reproduction. By the end of the 19th century, microbiologists began to observe the occurrence of conjugation in bacteria and called it ``conjuction'' to distinguish it from other organisms. will appear. Genetic analysis of conjugation was discovered by Lederberg and Tatum in 1947. They observed this phenomenon in an electron microscope. They observed this phenomenon in an electron microscope. It was determined that one of the cells is elongated and the other is oval. An elongated cell is a male type called F+ (donor), and an oval cell is a female type called F- (recipient). During conjugation, they approach each other and form a bridge between them. . Genetic factors in the donor cell are transferred to the recipient cell through the resulting bridge.

Summary: Bacteria reproduce mainly by fission. In all bacteria, the generation period includes different durations. As a result of the multiplication of bacteria, their population increases twice. It directly affects the growth of bacteria. When bacteria reach a certain size, their cell begins to divide. As bacteria grow progressively, their number increases rapidly. If we take the number of bacteria formed in a certain number of days, such large numbers are formed that it is difficult to even count them. They only show how fast bacteria can multiply. In fact, in nature, there are no conditions for a bacterium to multiply without obstacles for a long time. In addition, studying the genetics of microorganisms is important today. Because new strains with high activity are needed to obtain antibiotics. In addition, it is very important in the synthesis of vitamins, hormonal preparations, lysine and glutamine from amino acids and in the synthesis of other substances. Bacteria and actinomycetes can be influenced by radioactive rays and chemical mutagens, which can change the structure of DNA in their cells and direct them towards synthesizing substances useful for humans. Knowing well the physiological characteristics of bacteria, being able to change them and using this method to

use bacteria in agriculture, medicine and other fields is one of the most important issues today.

Used of literature:

1.А.Х.Вахобов. Микробиология ва вирусология.
2.Е.Н.Мищустин. Микробиология-1963.
3.П.А.Генрил. Микробиология сосивами вирусологи. "Просвещение"1974.
4.Н.Работовна. Обшая микробиология.
5.Иногомова М. Микробиология ва вирусология асослари.1983.
6.Бурхонова Х.К, Муродов.М.М Микробиология "Укитувчи"1975.
7.Мустакимов. Г. Д . Усимликлар физиологияси ва микробиологияси асослари. 1978.
8.Мишустин Е.Н. Шильпихова В.К. Биологическая фиксация атмосферного азота.М, Наука,1968
9.Жданов В.М. Эволютсия вирусов М:Изд-во МГУ, 1984.
10.Шлегел Г. Общая микробиология М. Изд-во.1985.
Фёдоров .
11.М.В.Микробиология. Тошкент, "Укитувчи" 1966.
12.Германов Н.И. Микробиология. М., Просовещение.1969,Изд. АН СССР