

ORAL MICROORGANISMS AND THEIR BIOLOGICAL ROLE

<https://doi.org/10.5281/zenodo.22074042>

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Abstract

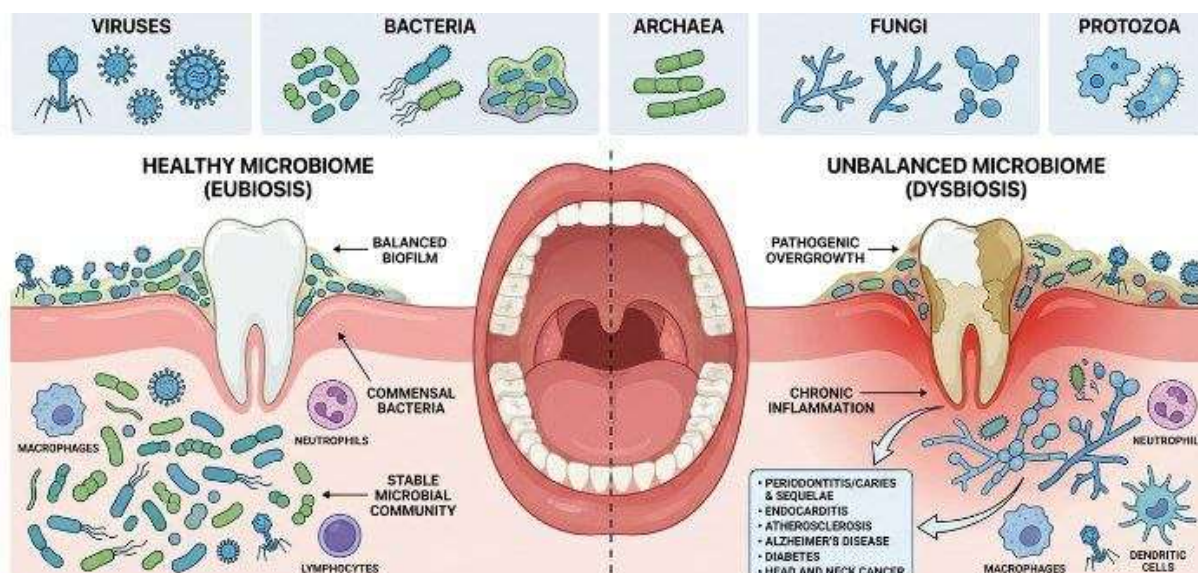
The oral cavity is one of the environments in the human body with a high diversity of microorganisms. It contains bacteria, fungi, viruses, and other microorganisms. Some of them are normal components of the oral microbiota and participate in maintaining the local microbial balance. However, when this balance is disturbed, certain microorganisms may proliferate and contribute to the development of dental caries, gingivitis, periodontal diseases, and other pathological conditions. This article discusses the main microorganisms found in the oral cavity, their biological characteristics, and their importance for oral health.

Keywords

oral cavity, microorganisms, microbiota, bacteria, fungi, oral hygiene, dental caries, periodontal tissues.

The oral cavity is a complex biological environment that is constantly exposed to the external environment. It contains teeth, the tongue, gingiva, buccal mucosa, and palate, each of which provides different conditions for microorganisms to colonize. The presence of microorganisms in the oral cavity does not always indicate disease. In healthy individuals, different microorganisms normally coexist in a balanced microbial community. The composition of the oral microbiota is influenced by factors such as age, diet, salivary secretion, oral hygiene, and general health. When the balance between microorganisms and the host is disturbed, dysbiosis may occur, creating favorable conditions for the development of oral diseases.

Hundreds of different microbial species may be found in the oral cavity. Bacteria represent the major part of the oral microbiota. Fungi and viruses are also present. Common bacterial genera include *Streptococcus*, *Actinomyces*, *Veillonella*, and *Neisseria*. Some streptococci participate in the formation of biofilms on tooth surfaces.



Certain bacteria can metabolize carbohydrates and produce acids as metabolic products. Fungi belonging to the genus *Candida* may also be present in the oral cavity. In healthy individuals, they are usually controlled by the host's defense mechanisms and the surrounding microbial community. Changes in the local environment or immune defense may lead to excessive growth of *Candida* and contribute to oral candidiasis. It would be incorrect to consider all oral microorganisms harmful. The normal oral microbiota plays an important role in maintaining the ecological balance of the oral cavity. Microorganisms compete with one another and may limit the excessive growth of potentially harmful species. The oral microbiota also interacts with the local immune system and contributes to the maintenance of oral homeostasis. However, changes in the composition and activity of the microbiota may promote pathological processes. For example, frequent consumption of sugary foods, inadequate oral hygiene, and reduced salivary flow can create favorable conditions for the growth of certain bacteria.

Microorganisms can form biofilms on tooth surfaces and other structures of the oral cavity. A biofilm is an organized microbial community in which microorganisms adhere to a surface and interact with one another. Dental biofilm contains various bacterial species. If it is not regularly removed, it can accumulate and become more complex. Microbial activity within the biofilm can produce substances that negatively affect dental and periodontal tissues. Therefore, regular tooth cleaning and proper oral hygiene are important for maintaining a healthy microbial balance. The oral microbiota plays an important role in the development of dental caries. Microorganisms located in dental biofilm can use fermentable carbohydrates from food and produce acids.

An increase in acidity can cause the dissolution of minerals from dental enamel. If this process continues for a long period, conditions favorable for the development of dental caries may occur. For this reason, prevention of dental caries requires not only effective oral hygiene but also limiting excessive consumption of sugars and other fermentable carbohydrates. Oral microorganisms can also influence the condition of the gingiva and periodontal tissues. Accumulation of dental biofilm can contribute to inflammation of the gingiva. When oral hygiene is

inadequate, the amount and composition of dental biofilm may change. As a result, clinical signs such as gingival redness, swelling, and bleeding may develop. The development of periodontal diseases depends not only on microorganisms but also on the host immune response. Therefore, periodontal diseases should not be attributed to a single microorganism alone. The composition of the oral microbiota is influenced by several factors: level of oral hygiene, dietary habits, age, amount and composition of saliva, presence of teeth, use of antibiotics, immune status, harmful habits such as smoking. Changes in these factors may affect the balance between microorganisms in the oral cavity. Maintaining proper daily oral hygiene is important for keeping the oral microbiota in a healthy state. Brushing the teeth twice a day, cleaning between the teeth, maintaining a balanced diet, and having regular dental examinations are recommended. It is also important to limit frequent consumption of sugary and sticky foods, drink sufficient water, and avoid using antibiotics without medical advice.

Conclusion:

The oral cavity is a complex biological environment inhabited by a wide variety of microorganisms. The normal oral microbiota exists in balance with the human host and contributes to the ecological stability of the oral cavity. However, disruption of this microbial balance may increase the risk of pathological processes such as dental caries and periodontal diseases. Therefore, the goal is not to eliminate all oral microorganisms but to maintain a healthy microbial balance. Proper oral hygiene, a balanced diet, and regular dental examinations are among the most important factors for maintaining oral health.

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