CONTEMPORARY MOUTHWASHES: THEIR PROPERTIES AND ANTIBACTERIAL EFFECT

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Introduction**.** The oral cavity is one of the most complex parts of the human body that consists of teeth, periodontal tissue, tongue and mucosa as well as secretory organelles. Thereby it harbors heterogeneous microbial community, which makes it highly prone to infectious diseases. Hundreds of bacterial species (e.g., Streptococci species as well as lactobacillus species) are involved in typical dental disease - caries. Mutans streptococci generally include Streptococcus mutans and Streptococcus sobrinus in the biofilms and produce acids as a by-product of metabolism of fermentable carbohydrates. For this reasons and more, scientific factory create some products for mouth washing "mouthwash", which have to fight against dental bacteria and harmful products of their metabolism. However, despite the wide assortment of mouthwashes, it is difficult to decide which commercial product is suitable for a particular purpose because of the variations of their antimicrobial efficacy, cytotoxicity and kinetics of the solutions. That is why it is very essential to go deep into the compounds of different mouthwashes and to understand for which purposes some of them should be used.

Aim. According to the stated above actuality of the topic, our aim was to compare some active ingredients of mouthwashes, which are sold on the consumers' market (everyday dental care), and to find out, which properties they have and which effect they may perform.

Material and methods. To compare the effect of some active ingredients of mouthwashes we have chosen two commercial products: "Colgate Plax Fresh Tea" and "Listerine Natural Green Tea". To investigate their properties and to find out their possible effects we used the following sources: literature and advertisement presented by the company-producer of a mouthwash; independent non-commercial scientific literature sources.

Results**.** As the active ingredient each company uses different molecule: Colgate- Cetylpyridinium chloride, Listerine - Eucalyptol, Menthol, and Thymol. So

what is the effect of this molecule on the bacteria of the mouth? The main indications are either the improvement of dental health or the prevention of infections caused by bacteria of the oral cavity in specific situations. Knowing the effect of these molecules on the bacteria and the mechanism of action can conclude the results of our comparison.

- Cetylpyridinium chloride: The polar and nonpolar regions of the molecule cause CPC to behave as a cationic surfactant with a net positive charge. CPC molecules bind to the negatively charged surface of the bacterial cell membrane. The nonpolar region of the molecule, which has similar traits to membrane phospholipids, penetrates the cell membrane of the bacteria, therefore altering it and generating an imbalance in the osmotic regulation, resulting in loss of cytoplasmic material and ultimately cell death. Its anti-gingivitis activity is also due to the neutralisation of proinflammatory bacterial toxins. CPC works by integrating these lipopolysaccharides to thereby alter their structure and neutralise them.

- Eucalyptol, Menthol, Thymol: The main ingredients in an antiseptic mouthwash like Listerine are eucalyptol, menthol, and thymol. Eucalyptol comes from naturally produced eucalyptus oil. Known for its strong and pleasant smell, it is used in sinus congestion treatments; cough suppressants and mouth wash to reduce inflammation. Menthol is derived from mint plants and is used in mouthwash for its cooling and pain-killing effect and it kill multiple kinds of bacteria, including Staphylococcus epidermidis and Escherichia coli. This effect seems to be due to menthol's ability to disturb the plasma membranes of bacteria, making them more permeable. Thymol is used in mouthwash for its antibacterial properties. The combination of these antiseptic and antibacterial ingredients kill germs on contact which in turn prevents gingivitis, calms inflammation or pain and prevents plaque buildup.

Conclusion**.** These two mouthwashes differ in their active molecules but the aim of their action is the same. At the same time the mechanisms of their action and their effect on bacteria are different, and these differences make each one special. But the main mechanism of their action is to disturb the plasma membrane of bacteria and to change the osmotic pressure.