

## ON THE ISSUE OF USING TOOTHPASTE FOR THE PREVENTION OF CARIES

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There are various therapeutic and prophylactic toothpastes that help reduce and prevent the formation of soft plaque, which is one of the causes of dental caries.

Of the entire arsenal of known toothpastes, the most effective are enzyme-containing toothpastes. The composition of this type of toothpastes includes enzyme preparations of proteolytic, amylolytic and lipolytic action, as well as dextranase and lysozyme.

A toothpaste containing dicalcium phosphate (40-60), glycerin (20-30), carboxymethylcellulose (0.5-5), enzymes dextranase or native neutral protease (0.4-4), water is known.

The main disadvantage of these pastes is their low anti-cariogenic activity and the content of chalk abrasives, dicalcium phosphate, aerosil, which causes tooth enamel to be eroded.

Therefore, the most promising are low-abrasive gel-like toothpastes. For example, a gel-like toothpaste "Fluident" containing sodium fluoride is known. However, this paste has a low cleaning ability, since it does not contain components that directly dissolve plaque.

The prototype closest to the claimed toothpaste is a paste containing chalk (36-40), sodium carboxymethyl cellulose (1,3-1,5), glycerin (20-25), sodium lauryl sulfate (1-2), alkaline protease from *Bacillus lichemformis* (0,5-2), potassium chloride (0,3-0,5), paraform (2-2.5), perfume oil (2-2.5), fragrance (1-1.5), water (the rest).

The well-known paste does not provide deep and complete hydrolysis of protein deposits and therefore reduces the formation of plaque by only 30% and reduces inflammatory phenomena in the oral cavity by 70%

Insufficient cleansing and anti-inflammatory effect of this toothpaste is apparently associated with the use of a water-soluble, native enzyme, which is rapidly inactivated in the application environment, can cause local irritating reactions in the oral cavity.

The purpose of the present invention is to increase the cleansing and anti-inflammatory properties of the paste.

The goal is achieved by the fact that the claimed paste contains as an enzyme preparation a complex of immobilized bacterial proteinases from *Bacillus subtilis*, and as a carrier a polyethylene glycol gel with the following component ratio, wt.

A complex of immobilized proteinases from *Basillus subtulis* with an activity of 20-50 PE/g 2.5-5 Polyethylene glycol gel 85-90 Sodium Lauryl sulfate 1.0-2 Sodium benzoate 1.0-2 Phosphate buffer 0.5-1 Saccharin 0.1-0.2 Fragrance 1.0-42 Dye 0.05-0.1 Water The rest

The proposed toothpaste is conventionally called "Cleodent".

The method of preparation of the claimed gel-like enzyme-containing toothpaste is as follows:

Gel, sodium lauryl sulfate, sodium benzoate, water are loaded into the container, mixed until a homogeneous mass is obtained. Then a phosphate buffer, saccharin, fragrance, and dye are added. After adding each component, the mass is mixed. Last of all, the enzyme preparation is loaded and mixed again. Then the paste is dispersed and centrifuged.

The proposed toothpaste reduces plaque formation by 60% and reduces inflammatory phenomena in the oral cavity by 81%

The proposed toothpaste has no toxic effect and is completely harmless with prolonged use.

The use of toothpaste for brushing teeth in 32 people, aged 20-23 years, for 1 month. it did not reveal any pathological phenomena on the part of the teeth, periodontal and oral mucosa. All the subjects noted the good organoleptic properties of the toothpaste, its pleasant smell and taste, transparency, absence of irritating effect on the mucous membrane and teeth.

The essential differences of the proposed toothpaste are the following.

As enzymes, a complex of immobilized proteinases of *Basillus subtilis* is used in an amount of 2.5-5 wt. with an activity of 25-50 PE / g, which, unlike water-soluble enzymes, is characterized by high stability and duration of specific action, due to the strong attachment of proteinases to the carrier polymer. This also explains its high therapeutic efficacy, the ability to maintain specific activity in a wide range of pH 6-11, the absence of allergic and locally irritating reactions.

The complex of immobilized proteinases provides prolonged intensive and deep hydrolysis of the protein structures of plaque and thereby achieves a high cleansing and anti-inflammatory effect of the paste.

#### **List of literature:**

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