

## A BASED ON NATURAL INGREDIENTS TECHNOLOGY FOR PRODUCTION OF DISINFECTANT AND ANAESTHETIC TOOTHPASTES

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### **Abstract**

This paper presents the development of technologies for the production of toothpastes for the care of the oral cavity, in particular for elimination of gingivitis, parodontosis, parodontopathy, stomatitis, fungal infections, Inflammatory process of the gums, bad breath, using only natural ingredients. They can be used for fungal and microbial disinfection, gum firming and caries prevention.

**Key words:** oral cavity, scorbutus / scurvy, parodontosis, parodontopathy, stomatitis, fungal infections.

### **Introduction**

Toothpaste, which is a jelly-like mass (sometimes in the form of gel), is designed for cleaning teeth and ensuring oral cavity hygiene. The Persians have made a great contribution to this sphere,

who throughout history have contributed to the development and improvement of toothpastes. They used to make toothpaste from crushed deer antlers, snail shells, and gypsum powder. Persian recipes included various herbs, minerals, honey, and aromatic oils. The prototype of the toothpaste currently in use was made in the UK. To produce toothpaste brick powder, clay and crushed porcelain were used. However, this toothpaste damaged the tooth enamel, to avoid which toothpaste was added to glycerin. At that time the toothbrush was not used yet, the paste was used with the help of fingers.

The Greeks and the ancient Romans were the founders of modern toothpastes and oral cavity hygiene.

Currently, the base component of toothpaste is silicate. To produce toothpaste the following components are used – water, which makes up 1-1.5% of the mass, foaming, binding, softening agents, preservatives, active agents, antiseptics, flavorings, herbal and other additives.

### **Conflict setting**

In the work a goal is set to expand the range of oral cavity care products and to get an improved toothpaste using only natural ingredients. In order to achieve this goal four different types of toothpaste based on the registered inventions of the authors are proposed.

### **Research results**

The composition of the **first paste** includes the following components in percentage of the mass, chalk powder 29.0-32.0%, honey 11.0-12.0%, sea-buckthorn seed oil 1.0-5.0%, bee pollen 9.0-11.0%, amaranth seed oil 5.0-6.0%, 3-methyl-6-isopropylcyclohexanol (menthol) analgesic and disinfectant agent 0.05-0.1%, sea-buckthorn paste - the rest [1].

Menthol is the main ingredient in the mint essential oil. It is a bitter, colorless crystalline substance. Its melting point is 43°C and boiling point is 216°C. It is poorly soluble in water and is good soluble in organic solvents. Instead of menthol, can be used thyme, basil, coriander essential oils.

Amaranth oil is used to treat radiation sickness. Its ripe seeds in composition are similar to breast milk. Amaranth contains a number of unique substances, micronutrient elements and vitamins, it also has anti-tumor effect, preventing the destructive cancer-free effect of free radicals on the cell. Amaranth oil is a powerful source of squalen. The amaranth was traditionally used to feed newborn infants, and soldiers, in the past, took with them amaranth grains during long treks. To the ancient Greeks, the amaranth symbolized immortality and was used in Chinese medicine as an anti-aging remedy. The UN Food Commission has included the amaranth in the list of important plants of the XXI century.

The bee blossom pollen contains proteins, nitrogen, carbohydrates, fats, ferments, sugar, minerals, some vitamins. For the proper development of the human body twelve of necessary amino acids are contained in pollen. Bee pollen regulates blood pressure, increases the number of red blood cells, increases the body's capacity for to work. It increases the activity of the gonads, regulates menstruation period, slows the growth of tumors. Bee pollen contains vitamins C, B1, B2, B6, P, A, E, D.

Chinese doctors consider the sea buckthorn as a berry of health and longevity and thus cure many diseases. The oil made from fruits and seeds helps healing wounds and burns. Sea-buckthorn paste can be replaced by rosehip, pineapple, raspberry, blackberry pastes.

Sea buckthorn contains other vitamins E, B1, B2, K, P,, carotene substances ascorbic acid, folic acid.

The recommended toothpaste is used like any other classic toothpaste. Its penetration into the body (in case of swallowing) is extremely safe. It has a pronounced analgesic and disinfectant effect. It is rich in unsaturated fatty acids, vitamins, minerals, natural amino acids.

The composition of the **second paste** includes the following components in percentage of the mass, chalk powder 20.0-22.0%, honey 10.0-11.0%, propolis 9.0-10.0%, powdered sugar 7,0%, - 9.0%, , and bee pollen - 10.0-13.0%, clove essential oil - 0.1-0.2% in olive oil - the rest [2].

Propolis, which contains flavonoids, essential oils, amino acids, fatty acids, is a powerful antioxidant, has bactericidal properties, and is anti-inflammatory.

It has a strong analgesic property (5.5 times stronger than novocaine, 3.5 times stronger than cocaine), is active against gram + and gram - microorganisms, also is against a number of viruses (especially in case of zoster, types of influenza). Propolis has a pronounced anti-fungal activity.

Clove essential oil, due to its main ingredient, eugenol, is a very good analgesic and anti-inflammatory, which makes it irreplaceable in dental practice (caries, periodontitis and in a number of other diseases).

Olive oil is considered to be the best known fruit oil in the world, it contains saturated and unsaturated fatty acids, vitamins A, E, carotenes, antioxidants, it has free radicals neutralizing property.

The recommended toothpaste is used like any other classic toothpaste. Its penetration into the body (in case of swallowing) is extremely safe. It has an gingival bleeding stopping effect, restoring the normal functioning of the gums, analgesic (local anesthetic), rejuvenating the oral cavity, anti-inflammatory, antifungal, antiseptic, antibacterial effect.

It is rich in vitamins, minerals, natural carbohydrates, proteins, natural amino acids, flavonoids, cinamon acid.

The composition of the **third paste** consists of the following ingredients in percentage to the mass, chalk powder 20.0-40.0%, propolis 6.5-7.5%, powdered sugar 10.0-17.0%, sea-buckthorn fruit oil 10,0-20,0%, sea-buckthorn kernel oil - 4,0-10,0%, coriander essential oil - 0,5-1,0% and olive oil - the rest [3].

The physical and chemical properties of coriander seed essential oil are presented in Table [4].

Table

Physical and chemical properties of coriander essential oil

T <sup>0</sup> K	V <sub>i</sub> ·10 <sup>7</sup> , mol/l.s	The mass of essential oil, mg	τ, minute	f[InH] <sup>a</sup> ·10 <sup>4</sup> mol/l	V <sup>o</sup> ·10 <sup>6</sup> mol/l.s	k <sub>7</sub> ·10 <sup>-4</sup> l/mol.s	k <sub>7i</sub> ·10 <sup>-2</sup> l/mol.s
348	1,25	8,25	10	0,084	1,39	3,83	16,30
348	1,25	16,50	18	0,082	0,83	3,81	16,42
348	1,25	22,64	25	0,083	0,62	3,85	16,29
348	2,50	22,64	13	0,083	1,23	3,8	15,80
348	0,625	22,64	50	0,082	0,33	3,75	15,92
348	0,35	22,64	90	0,084	0,18	3,90	16,48
339	0,733	12,25	38	0,137	0,55	2,55	10,06
339	0,733	24,50	76	0,137	0,33	2,60	8,96
339	0,733	30,75	100	0,143	0,23	2,45	10,05
339	1,250	48,00	82	0,129	0,25	2,55	11,20
328	0,344	6,12	82	0,276	0,28	1,52	6,31
328	0,344	3,06	41	0,280	0,46	1,48	6,34
328	0,344	1,53	21	0,275	0,67	1,56	6,29
328	0,344	4,80	64	0,274	0,34	1,53	6,35

The recommended toothpaste is used like any other classic toothpaste. Its penetration into the body (in case of swallowing) is extremely safe. It has expressive refreshing, antiseptic, gum disinfecting, gum bleeding prevention, analgesic (local anesthetic) properties.

It is rich in camphor, vitamins, minerals, natural amino acids, flavonoids, cinnamonic acid, linalool, monoterpene hydrocarbons.

The composition of the **fourth paste** consists of the following components in percentage to the mass, chalk powder 32.0-34.0%, propolis 5.0-6.0%, honey 12.0-14.0%, rosehip fruit oil 17.0-20.0%, mint essential oil 4.0-7.0%, and olive oil - the rest [5].

Rosehip kernel oil and fruit oil are known for their unique fatty acid composition. Rosehip fruit oil and kernel oil contains saturated and unsaturated fatty acids, carotenoids, tocopherol and vitamins. In medicine, rosehip fruits are used in case of C and P hypo- and avitaminosis, which occurs due to violations of the permeability of the cell membrane walls, due to the decrease of the body's resistance to endogenous and exogenous factors. Rosehip kernel oil and fruit oil are considered as a powerful antioxidant. Due to its multifunctional and important properties, olive oil has always been widely used in various fields of medicine and in various industries.

The recommended toothpaste is used like any other classic toothpaste. Its penetration into the body (in case of swallowing) is extremely safe. It has expressive refreshing, antiseptic, gum disinfecting, gum bleeding prevention, analgesic (local anesthetic) properties.

It is rich in menthol, camphor, vitamins, tannins, terpenes, minerals, natural amino acids, flavonoids, cinnamonic acid, linalool, monoterpene hydrocarbons.

Mint essential oil can be replaced by coriander, parsley, thyme, wormwood, cloves, celery, vanilla, cinnamon essential oils.

### Conclusion

This work allows to expand the range of oral cavity care products, helps to strengthen the roots of the teeth, the elimination of various diseases of the oral cavity.

The development of technologies designed for production of toothpaste using exclusively natural ingredients will allow to have organic products in the field of pneumonia, periodontitis, stomatitis, fungal infections, gingivitis, which will be used not only in Artsakh and Armenia but also can be exported to many countries.

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**ԲՆԱԿԱՆ ԲԱՂԱԴՐԻՉՆԵՐԻ ԿԻՐԱՌՄԱՄԲ ԱՏԱՄԻ ԱԽՏԱՀԱՆԻՉ ԵՎ  
ՑԱՎԱԶՐԿՈՂ ՄԱԾՈՒԿՆԵՐԻ ԱՐՏԱԴՐՈՒԹՅԱՆ ՏԵԽՆՈԼՈԳԻԱՆ**

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Աշխատանքը վերաբերում է բերանի խոռոչի խնամքի միջոցների, մասնավորապես լնդախտի, պարադոնթոզի, պարադոնթոպատիայի, ստոմատիտների, սնկային ախտահարումների, լնդային բորբոքային պրոցեսների, բերանի տհաճ հոտի վերացման նպատակով, բացառապես բնական բաղադրիչների կիրառմամբ ատամի մաժուկների արտադրության տեխնոլոգիաների մշակմանը: Դրանք կարելի է կիրառել նաև սնկային և միկրոբիալ ախտահանումների, լնդերի ամրացման և կարիեսի զարգացումը կանխելու նպատակով:

**Բանալի բաղեր.** բերանի խոռոչ, լնդախտ, պարադոնթոզ, պարադոնթոպատիա, ստոմատիտ, սնկային ախտահարումներ:

**ТЕХНОЛОГИЯ ПРОИЗВОДСТВА ДЕЗИНФИЦИРУЮЩИХ И ОБЕЗБОЛИВАЮЩИХ  
ЗУБНЫХ ПАСТ С ИСПОЛЬЗОВАНИЕМ НАТУРАЛЬНЫХ КОМПОНЕНТОВ**

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Работа посвящена разработке технологий производства средств по уходу за полостью рта, в частности, зубных паст с использованием исключительно натуральных компонентов для лечения цинги, пародонтоза, пародонтопатии, стоматита, грибковых инфекций, воспалительных процессов десен, устранения неприятного запаха изо рта.

Их можно использовать также для грибково-микробной дезинфекции, укрепления десен и профилактики кариеса.

**Ключевые слова:** полость рта, цинга, пародонтоз, пародонтопатия, стоматит, грибковые инфекции.

Ներկայացվել է՝ 30.06.2021թ.

Գրախոսման է ուղարկվել՝ 30.06.2021թ.

Երաշխավորվել է տպագրության՝ 14.07.2021թ.