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OXYGEN-ALKALINE BLEACHING CLEANERS: IN WHICH COUNTRY AND WHEN THESE COSMETICS AND HYGIENE PRODUCTS INVENTED

-Cosmetic and hygienic oxygen-alkaline bleaching agents consisting of hydrogen peroxide and sodium bicarbonate were invented at the beginning of the 21st century in Russia.

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ABSTRACT

Until the end of the 20th century, the combination of hydrogen peroxide with sodium bicarbonate was not offered as a cosmetic and/or hygiene product. These new cosmetics and hygiene products were first proposed in the early 21st century. At this time, in the city of Izhevsk in the Russian Federation, a new group of antiseptics was discovered, consisting of hydrogen peroxide and sodium bicarbonate and having a very strong local effect on pus and blood: the ability to effectively and quickly dissolve and whiten dental plaque, spots and blood clots and thick pus. In the following years, it was proved that the local use of a combination of baking soda, hydrogen peroxide and warm water provides a safe urgent dissolution, discoloration and removal of these dense biological masses. It has been shown that the dissolution, bleaching, and removal of organic pollutants is achieved by alkaline saponification, cavitation loosening, and oxidative discoloration of pigments. It is proposed to use an open combination of oxygen alkaline bleaching cleaners not only in medicine as cosmetic and hygiene products, but also in everyday life as safe bleach cleaners for ceramic dishes.

Key words: history, drugs development, hydrogen peroxide, sodium hydrogencarbonate, bleach, cleaner.

Introduction

In the second half of the 20th century, the world's life expectancy and the proportion of older people in society increased, which led to an increase in plaque-covered teeth and increased the population's demand for oral hygiene products. For a long time, toothbrushes, toothpicks, and chewing sticks have traditionally been used as personal hygiene products. In recent years, oral irrigators have been proposed for this purpose. However, the effectiveness of all these means remained insufficiently high, especially in the elderly¹. Other than that, there was still no bleaches for bruises, bloodstains, or pus²⁻⁴. All this encouraged researchers to look for new cosmetics and hygiene products.

Materials and methods

In the period from 1999 to 2019, studies were conducted on the possibility of dissolving and bleaching blood stains, pus, food dyes and plaque due to a completely new approach, namely, due to the physical and chemical properties of solutions and suspensions. In order to create original developments, a thorough study of scientific and patent literature was carried out. The search was performed using the Google Patent, Google Scholar, Scopus, and PubMed databases. The keywords used were limited to sanitary and hygiene products and their use for discoloration and removal of blood stains, pus and plaque from the surface of teeth, dentures and other dental structures, as well as their use for washing ceramic products in everyday life.

Results

Today it is possible to sum up the results of the work done. Fortunately, we can say that the prospects of a new approach applied to the development of new hygiene and cosmetic products have been proved with greater honor, and a solid Foundation has been laid for a new scientific direction in pharmacology. It so happened that the main theoretical and practical part of the work was done during these years exclusively in the city of Izhevsk in the Russian Federation. As a result, Russian scientists were able to develop oxygen-alkaline bleaching cleaners related to personal hygiene products²⁻⁴. In addition, new devices and methods of using new oxygen-alkaline bleaching cleaners have been developed, which provide emergency bleaching cleaning of contaminated skin surfaces, mucous membranes, teeth, dentures, clothing, cotton-gauze bandages, as well as various ceramic products with a single application due to a combination of such physical and chemical factors of local interaction as the "necessary" alkaline, oxidative, osmotic, temperature and carbonated activity that ensures the cold boiling process^{1,5}.

For the first time in the world, unique cosmetic and hygiene products have been proposed that ensure the dissolution and bleaching of blood stains, pus and plaque within a few minutes after their local interaction begins. It is shown that bleaching cleaning of a contaminated surface can be achieved by using not a new chemical compound, but a combination of old (long-known) chemical compounds with new (previously unused) physical and

chemical properties⁶. It is important to emphasize that these properties are most fully revealed when local interaction of cleaners with biological pollutants containing the enzyme catalase (with traces of blood, pus and/or plaque).

The world novelty of Russian developments is confirmed by patents issued for 25 inventions, the list of which includes new devices, medicines and methods of their application. All of them provide emergency removal of plaque, blood and pus stains from the surface of teeth, dentures and food contamination stains from the surface of ceramic dishes. In addition, it was possible to develop toothpicks and oral irrigators with improved design, toothpastes, rinsing and irrigation solutions with a new formulation, as well as highly effective ways to use solutions for removing plaque using an irrigator^{1,7}. The most striking representative of the developed group of bleaching cleaners for blood stains, dental plaque and ceramic tableware pollutants is a warm (at a temperature of +37 - +45 °C) a supersaturated aqueous solution of sodium bicarbonate containing hydrogen peroxide in moderate concentrations and oxygen gas under excessive pressure⁸.

New cosmetic and hygiene products provide emergency bleaching cleaning of the surface due to alkaline, oxidative, temperature, osmotic, carbonated activity. The activity of open liquid bleaching cleaners differs in that they all provide a "cold boiling" process, which occurs immediately after reducing the internal pressure in them to normal values and/or when interacting with a biological mass containing the enzyme catalase.

Open new cosmetic and hygiene products provide reliable and fast surface

cleaning due to a combination of the following local interaction factors:

- The main physical factors are the liquid form, hyperthermia, increased oxygen gas content, excessive internal pressure in the liquid, and cold boiling of the liquid when the pressure decreases and/or under the action of the catalase enzyme.

- The main chemical factors are moderate alkaline, oxidative activity and the ability to release molecular oxygen as a gas in the presence of the catalase enzyme.

- The main physical and chemical factor is the "necessary" osmotic activity.

Conclusion

Consequently, at the beginning of the 21st century in the city of Izhevsk of the Russian Federation, the Foundation was laid for the formation of a new group of cosmetic and hygiene products with a completely new biological activity, namely, the ability to urgently dissolve and discolor plaque, thick blood spots, pus and other biological biomaterials containing the enzyme catalase. In the period between 1999 and 2019, 25 inventions were developed. The biological activity of these products is a bleaching and cleansing effect, which is manifested due to a special formulation and unique physical and chemical properties. Medicines of the new group of cosmetics and hygiene products are solutions of hydrogen peroxide and sodium bicarbonate, which may additionally contain gases (for example, oxygen gas, carbon dioxide gas or inert gases) under excessive pressure.

New cosmetic and hygiene products provide emergency bleaching cleaning of the surface due to unique

alkaline, oxidative, temperature, osmotic, carbonated activity.

Conflict of interest: None declared.

References

Urakov A, Urakova N, Reshetnikov A.

Oxygen alkaline dental's cleaners from tooth plaque, food debris, stains of blood and pus: A narrative review of the history of inventions. Journal of International Society of Preventive & Community Dentistry. 2019;9(5): 427-433. doi: 10.4103/jispcd.JISPCD_296_19.

Urakov AL. Medications and bruises: past, present, and future. Reviews of Clinical Pharmacology and Drug Therapy. 2020; 18(2):161–170.

<https://doi.org/10.7816/RCF182161-170>.

Urakov AL, Urakova NA. Hydrogen peroxide discolors blood in the cavity of the hematoma under the nail and in the skin over the bruise. Regional Blood Circulation and Microcirculation. 2020;19(2):67-74. (In Russ.)

<https://doi.org/10.24884/1682-6655-2020-19-2-67-74>.

Urakov AL. Pus solvents as new drugs with unique physical and chemical property. Reviews on Clinical Pharmacology and Drug Therapy. 2019;17(4):89-95. doi: 10.17816/RCF17489-95.

Urakov AL. Creation of "necessary" mixtures of baking soda, hydrogen peroxide and warm water as a strategy for modernization bleaching cleaners of ceramic. Epítőanyag – Journal of Silicate Based and Composite Materials. 2020;72(1):30 – 35. DOI:

<https://doi.org/10.14382/epitoanyag-jsbcm.2020.6>.

Urakov AL, Urakova NA, Stolyarenko AP.

How to turn an old medicine into a new medicine. J.Bio.Innov. 2020; 9(5): 774-777. <https://doi.org/10.46344/JBINO>.

Urakov AL, Urakova NA, Gadelshina AA.

Hydrogen peroxide as a remedy for bruising. J.Bio.Innov. 2020; 9(5): 934-951. <https://doi.org/10.46344/JBINO.2020.v09i05.32>.

Urakov AL. Gases as ingredients of medicines. Reviews on Clinical Pharmacology and Drug Therapy. 2020;18(4):351-358.

<https://doi.org/10.7816/RCF184351-358>.