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COSMECEUTICAL MASKS USING THERAPEUTIC MUD OF AKHTALA (GEORGIA) AND PRODUCTS FROM PLANT MATERIALS

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ABSTRACT

Therapeutic muds are used in many countries for balneologicalpurposes. Are known drugs, based on mud and water from the Dead Sea, a number of reservoirs in Russia and the Baltic, which are used in the treatment of eczema, osteoarthritis, neurodermatitis, psoriasis, scleroderma, keratoderma, ichthyosis and other diseases. They have an ointment like consistency that is convenient for use, but cannot be considered a cosmetic product due to a certain spectrum of contraindications in the undiluted form. In independent use, there is no complete probability of safety of their use for facial skin. The possibility of the influence of undiluted mud on the sensory properties of the final product in cosmeceuticals should also be taken into account. More appropriate in cosmetics are compositions in the form of creams, ointments, lotions and other similar products, in which mud is mixed in a certain ratio with the base for their even distribution in combination with the base and medicinal substances, obtained from plant materials. This message describes the formulation of the basis of therapeutic masks, using pseudovolcanic therapeutic mud of Akhtala (Georgia), as well as the possibility of use in cosmetic masks along with Akhtala a number of products, obtained from medicinal raw materials, growing in Georgia. We used extracts of St. John's wort and immortelle herbs, an extract of chamomile and calendula flowers, an extract from green tea leaves, sweet almond oil, grape seed, shea, and olive oil. The obtained results make it possible to predict the possibility of obtaining a cosmetic product using the above mentioned substances.

KEYWORDS: Akhtala (Georgia), therapeutic mud, masks.

INTRODUCTION

Akhtala is a therapeutic mud, a source located in Georgia, contains a number of micro and macro elements and organic substances, necessary to nourish the skin.[1] When mud Akhtala is applied to the skin for balneological purposes, biologically active substances that have a therapeutic effect on the skin, enter its cells, restoring and regenerating them. At the same time, a number of different cosmeceutical problems are solved. There is an improvement in the structure of mature and aging skin, the foci of inflammation and the number of wrinkles are reduced, and the skin is less fat. Based on the literature data, mud masks contribute to the treatment of eczema, osteoarthritis, neurodermatitis, psoriasis, scleroderma, keratoderma, ichthyosis and other diseases.[2,4]

According to chemical and biological indicators, therapeutic mud is a substance ,which has an ointment like consistency, that is convenient for use, but it cannot be considered a cosmetic product, because may have the same spectrum of contraindications as with traditional mud applications. Another limiting factor for the use of undiluted mud in cosmeceuticals is its effect on the sensory properties of the final product. Therefore, there is no likelihood of safety of its use for the skin of the face when it is used independently. Based on the facts, metioned above, there are more appropriate mask compositions, in which therapeutic mud is evenly distributed in combination with the base and medicinal substances, obtained from plant materials. In this case the cosmeceutical effect is increased.

Research methodology. Taking into consideration the specific application of the mask, in addition to the therapeutic mud, extracts and oils of plant origin were used. The focus of using the extracts was determined by the presence of anti-inflammatory, antifungal, antibacterial and antiseptic properties and, in some cases, by the ability to reduce the level of fat in the skin. When considering the use of oils, the oils, containing oleic acid in the maximum concentration, were used. This is explained by this acid properties, necessary for the process of improving the quality of the skin .

Results and Analysis. Let us consider the basic chemical composition of the used extracts and oils. St. John's wort grass contains tannins, flavonoids, phenolic compounds, essential oil, a number of organic acids and vitamins. A similar composition is found in dry extracts, which leads to their anti-inflammatory, desensitizing, antifungal, antibacterial, antiseptic properties, tonic, astringent and reparative properties. This, taking into account their antioxidant activity, allows the use of dry extracts for diseases, associated with inflammatory skin processes..

Creams, containing St. John's wort extract, soften the skin and protect against aggressive environmental factors. Chamomile flower extract contains essential oil, flavonoids, sterols, triterpenoids, sesquiterpenes, a number of organic acids, macro- and microelements. This causes its anti-inflammatory, antibacterial, antiseptic, soothing properties. Calendula flower and stalk extract contains carotenoids, flavonoids, essential oils, sterols, triterpenoids, polysaccharides, micro and macro elements. It exhibits bactericidal, anti-inflammatory, antibacterial, antiseptic, antioxidant, healing properties, stimulates blood circulation and lymphatic drainage. The extract from the leaves and stems of green tea contains polyphenols - epigallocatechin-3-gallate (EGCG), epigallocatechin (EGC), clonecet, Evo It exhibits antioxidant, cytoprotective and anticarcinogenic effects. Due to the cardiovascular and anti-atherogenic effect, green tea flavonoids improve microcirculation and blood vessel tone. Thanks to its antioxidant effect, it protects the skin from harmful substances and ultraviolet radiation, and is a care product for mixed, sensitive, damaged, mature facial skin. Extracts from inflorescences and immortelle sand grasses contain essential oil, flavonoid glycosides, flavonoids, vitamins, acids, mineral salts and microelements, coloring matter etc. Helichrysum extract has antibacterial, anti-inflammatory and wound healing properties, promotes skin rejuvenation.

Let us consider the effect of vegetable oils, containing a large amount of oleic acid, which is necessary for the construction of biological cell membranes, being a transdermal carrier of the active components of the cream, normalizes lipid metabolism in the skin, its resiliency, elasticity, moisture retention, strengthening of the blood vessels and increase their elasticity. It contributes to the dissolution of excess skin fats. It is a part of almond oil (up to 70%); shea oil (up to 40%); grape seed oil (up to 70%) and others.

The following tests were used to develop the options for masks and the formulation of cosmetic masks — visually appearance and color, colloidal and thermal stability, ease of application, fluidity and absorbency, osmotic activity, and unirritation when applied to the inside of the bend of the hand. From the investigated options for the bases, focusing on the above indicators, the following compositions were selected (Table 1.)

Table 1: Recipe options of ointment bases for masks.

№	Name of Components	Option 11%	Option 21%
1	Distilledmonoglycerides	4.2	6.3
2	Glycerin	5,5	6,5
3	CetylPalmitate	6.5	5,0
4	Emulsionwax	2.0	2.0
5	Beeswax	4.1	5.3
6	Carbopol	1,0	1,0
7	Grape oil	3.5	4.0
8	Water	Else	Else

Both bases meet the above requirements. It should be noted that their osmotic activity did not exceed 90%, which is advisable, taking into account the purpose of the application.

The study of the process of solubilization of therapeutic mud with the basics was carried out by mixing at a temperature of 30- + 2 degrees and intensive mixing. When the mud concentration in the base is at the level of 4%, a colloid stable mass is already formed, and due to the relatively lower viscosity and higher resistance it is more difficult to hold it on the skin. Introduction to the base of the amount of the mud of more than 10% causes a changes in its colloidal structure. Judging by visual observations and rheological data, the most appropriate mud Akhtala content in the base is 6-8%. At the same time, visually the cream in terms of uniformity and appearance (except for color) did not differ from the base, during centrifugation there was no exfoliation of the oil and water phases, the separation of the mud phase did not exceed 7-10% of the volume of introduced mud. When studying the process of solubilization of the obtained mass with biologically active extracts from plant materials were used dry, glycerin, water, water-alcohol (ethil alcohol content of 57-60%) extracts. Their maximum concentration in the mixture of the base with mud Akhtala was studied.

The results are shown in table 2.

Table 2: The maximum possible concentration of the extracts in the mixture is the basis with mud Akhtala (with the introduction of 8.0% of therapeutic mud into the base).

№	Nameofextract	Maximum possible concentration of extracts,%			
		Water extract	Water-alcoholic extract	Glycerin extract	Dry extract
1.	Hypericumherb extract	18.5	15.5	5.3	5,1
2.	Chamomile flower extract	15.0	15.5	5.6	4,9
3.	Calendula Flower extract	12.0	14.0	5.6	5.6
4.	Green Tea Leaf extract	15,9	15,5	6.3	2,9
5.	Helichrysum herb extract	11.8	13.2	5.7	4,6

Based on the data, given in Table 2, the possible maximum concentration in the mask of water and water-alcohol extracts is on average 2.5-3.0 times more than glycerin and dry. This is explained by the lower concentration of the amount of biologically active substances in the water and water-alcoholic extracts and their solubilization to a greater extent with the mixture base - mud Akhtala. If the mask is based on sufficiently high effective emulsifiers, the addition of such an amount of water and water-alcohol extracts does not change the colloidal stability of the resulting mixtures, but to a large extent changes their viscosity. Therefore, their fluidity increases and retention on the skin of the face decreases. In the case of using dry extracts, either they should be relatively easily dissolved in the water of the base, or solubilized with it. The use of glycerin extracts (containing up to 30-35% biologically active substances) allows one to predict in advance the possibility of quick and almost complete solubilization of the extract with the base. It should be noted that the amount of biologically active substances, introduced into it, when using the above extracts, is comparable. A study of the qualitative composition of the obtained masks by thin layer chromatography on Silufol plates showed practical identity. Data of a similar study of the solubilization of vegetable oils with bases are given in table. 3.

Table 3: Solubilization of vegetable oils with a base (Mud Akhtala content is 8.0%).

№	Nameofoil	Maximum possible amount of oil,%	Stability of samples within 8 months of storage
1	Sweetalmondoil	12.0	is stable
2	Grapeseedoil	13.0	is stable
3	Olive oil	13.0	is stable
4	Shea butter	5.0	is stable

Conclusion. The obtained data allow us to determine the overall strategy for creating masks, containing medicinal mud Akhtala. Using its antibacterial and anti-inflammatory properties, wound healing activity, the ability to adsorb toxic substances and fats from the surface of the skin, the presence in it and in the attendant solution of mineral substances (iron, sodium, potassium and others), that have a certain biological function, it is possible to use it in certain combinations in ointment form to treat problem, fat and aging skin. Moreover, when using in ointment forms the mud in the above concentration, skin irritation, allergic, or inflammatory processes are not observed.

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