

THE BASE INGREDIENTS IN THE TECHNOLOGY OF ANTIFUNGAL CREAMS

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Introduction. Antifungal creams usually are easy to use and cause no side-effects. These are used to treat fungal infections of the skin, scalp and nails. From the point of view of biopharmacy, a rational choice of the basis determines the pharmacological activity of the drug in many ways, taking into account the nosology of the disease.

Aim. The purpose of the information-theoretical studies was to analyze literature data on the current nomenclature of the most commonly used excipients in the bases of registered antifungal creams.

Materials and methods. Theoretical analysis and synthesis of scientific literature data.

Results and discussion. Excipients of the base form, structure, provide the optimal consistency of the cream and the necessary concentration of medicinal substances. Emulsions of the type water / oil and oil / water serve as structure-forming systems. Ionic emulsifiers, ethoxylated nonionic emulsifiers, or a mixture thereof with long chain fatty acids (mixed emulsifiers) are used to reduce surface tension and stabilize emulsions.

The mixture of cetyl alcohol and stearyl alcohol as named cetostearyl alcohol is used sometimes in creams.

Cetyl alcohol (hexadecan-1-ol or palmityl alcohol) is a fatty alcohol. At room temperature, cetyl alcohol takes the form of a waxy white solid or flakes. The name cetyl derives from the whale oil (Latin: cetus) from which it was first isolated. Cetyl alcohol is insoluble in water but soluble in alcohol and in vegetable oils. When melted, it is miscible with fats, mineral oils, and paraffins. It is used as an auxiliary emulsifier for both water-in-oil and oil-in-water emulsions in concentration 0,5 to 10 %. When applied to the skin, it is absorbed and retained in the epidermis. This accounts for its lubricating, emollient property. It leaves the skin feeling smooth and soft. Emollient is a refatting agent, i.e. an ingredient of a cream formulation that provides the skin with the fat it needs. It reduces evaporation and thus increases the moisture content of the skin.

Stearyl alcohol (1-octadecanol or octadecyl alcohol) is an organic compound classified as a fatty alcohol. It takes the form of white granules or flakes, which are insoluble in water.

Polysorbate 60 (Polyoxyethylene Sorbitan Monolaurate) is a synthetically produced thickening oil-in-water emulsifier. Polysorbate 60 is produced by the ethoxylation of sorbitan. Sorbitan is the dehydrated form of sorbitol, a sugar alcohol that can naturally be found in some fruits.

Cetyl esters wax is a mixture primarily of esters of saturated fatty alcohols and fatty acids (C14 to C18). Cetyl esters wax is a synthetic substitute for the natural product spermaceti, which was formerly extracted from the head of sperm whales. Cetyl esters wax is a stiffening ingredient and emollient in cream bases.

Octyldodecanol is a branched-chain primary alcohol (the isomer 2-octyl-1-dodecanol). It used as a medium spreading emollient and a potential enhancer of active ingredient permeability through the skin in creams.

Sorbitan monostearate is an ester of sorbitan and stearic acid. It is a non-ionic surfactant with emulsifying, dispersing, and wetting properties.

Cetyl palmitate is a refatting agent that promotes and improves the formation of emulsions. Cetyl palmitates are obtained by the esterification of fatty acids and fatty alcohol. Creams made with cetyl palmitate are very compact and leave a pleasant skin feeling. Especially people who are allergic to beeswax find a good alternative in cetyl alcohol. Application concentration is 2 to 6 %.

Isopropyl myristate is the ester of isopropyl alcohol and myristic acid. It is a moisturizer with polar characteristics used in topical medical preparations to ameliorate the skin absorption. It is used to reduce the fat content of the oily phase in creams.

Cetomacrogol 1000 is the trade name for polyethylene glycol hexadecyl ether, which is nonionic surfactant and acts as a dispersing agent, a solubilizer, an emulsion stabilizer. It is used as an oil in water emulsifier for creams.

Liquid paraffin is a highly-refined mineral oil that is used in cream formulations because it help the skin retain moisture.

The water-removable bases of creams may “dry out” due to evaporation of the water during storage, because water is the external phase of oil / water emulsions in hydrophilic creams. Humectants may be added to retard dehydration; glycerin and propylene glycol in concentrations of 2% to 5% are commonly used for this purpose.

Conclusions. Thus, data on the use of the main auxiliary components in the composition of modern antifungal creams were summarized.