

usNeo™ - a Naturally Effective Deodorant and Antibacterial Active

Authors: J. Smits, B. Senti, N. Herbst, Cosmetochem International AG, Steinhausen/ZG, Switzerland

Abstract

The effectiveness and ease of use of a new deodorant active based on natural usnic acid formulated in plant-derived 1,3-propanediol was investigated in different *in vitro* and *in vivo* studies. Determination of the minimum inhibitory concentrations (MIC) of the test active, showed it to be particularly effective against Gram-positive bacteria, many of which are responsible for causing body odour. These include *corynebacteria*, *staphylococci* and *propionibacteria* in particular. In an *in vivo* Sniff Test, the deodorising effect of the test active after 5 days of use was evaluated by the assessment of body odour over 48 hours at three time points. In addition, axilla swabs were taken during the Sniff Test to investigate the test active's effect on the under-arm bacterial population. In order to compare the test active to other established deodorant actives, *in vivo* tests were conducted also using triclosan and ethylhexylglycerin. The test active showed deodorising effects lasting at least 24 hours. Compared to the other deodorant actives, it demonstrated a better deodorising effect than ethylhexylglycerin and an equally as good effect as triclosan. The determination of bacterial counts showed that the deodorant formulation containing the test active produced the smallest reduction in bacterial numbers and therefore, out of the three actives tested, preserved the most skin flora. Thorough safety tests confirmed the test active to be safe to use as a deodorant active. The tests conducted therefore demonstrate that the test active is effective and safe to use.

Introduction

A person's individual odour is genetically determined and can also be affected by food or medication^(2, 4-6). Although sweating plays an important role, the classic association of sweat and body odour is only part of the explanation. It is true that unwanted body odour occurs mainly in the axilla (underarm) area and the feet but odour is only indirectly caused by secreted sweat. It is actually caused by bacteria living on the skin which find ideal conditions for growth in the warm areas of the body that tend to stay moist. They metabolise certain compounds found in sweat, leading to the occurrence of unwanted body odour. The three most frequently used methods to deodorise (combat body odour) are to mask

the smell with perfume, to reduce the quantity of sweat and to inhibit odour-producing bacteria⁽¹⁾.

Quantities of sweat can be reduced by using what are known as antiperspirants. In most cases these are metallic salts based on aluminium, zinc or manganese⁽²⁾. The most frequently-used antiperspirants are aluminium salts such as aluminium hydroxychloride, aluminium bromhydrate or aluminium sulphate. The volume of sweat produced is reduced by narrowing the sweat ducts. Antiperspirants form complexes with water, small scales of skin and lipids to create a protein mass which blocks the sweat glands. In this way the amount of sweat produced can effectively but not permanently be reduced. Furthermore antiperspirants have astringent effects on skin, tightening the sweat glands which are further narrowed.

Inhibition of body odour-causing bacteria is another important strategy for deodorisation. By inhibiting or deactivating odour-producing bacteria, there is no or only slight metabolism of sweat components thus preventing/reducing the occurrence of body odour. The microorganisms present in the underarm area include Gram-positive bacteria of the *Corynebacterium*, *Streptococcus*, *Propionibacterium* and *Micrococcus* genera as well as a yeast of the *Malassezia* genus. Bacteria responsible for production of body odour are *corynebacteria*, *streptococci* and *propionibacteria*^(2, 3). A complete sterilisation of skin however should be avoided, as normal skin flora provides protection against bacterial infection caused by foreign pathogenic bacteria⁽⁷⁾.

Since the use of the alum stone by the Romans⁽⁸⁾, a multiplicity of deodorants has been established. Among these are the synthetic substances triclosan and ethylhexylglycerin, which today are used frequently together with a range of different plant extracts or fractionated substances derived from plants. Although triclosan is approved both by the European and American health authorities, it is suspected that it may cause cross-resistance in microorganisms. Moreover it has been proven that certain quantities of applied triclosan have been detected in the body and the milk of nursing mothers. Triclosan