

Abstracts

International Journal of Cosmetic Science Vol. 31, No. 5, 2009*

Review Article

Role of topical peptides in preventing or treating aged skin

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Ageing, a basic biological process seen in all living creatures, is not preventable. Surgical and topical modalities have been invented and substances were applied topically to alter the ageing process. Peptides and proteins, frequently used for this purpose, were categorized into four groups: signal peptides, enzyme-inhibitor peptides, neurotransmitter-inhibitor peptides and carrier peptides. We comprehensively review eligible studies -including controlled ex vivo or in vivo efficacy studies on any topical peptide or protein that has been administered to treat signs and symptoms of ageing.

Fluorescence and coloration of grey hair

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Grey hair samples were collected from 11 individuals and separated into un-pigmented and pigmented fibres (International Hair Importers). Fluorescence measurements

were obtained by using a double-grating fluorescence spectrophotometer and a bifurcated fibre optics accessory to measure the spectra directly from the surface of hair at various distances from the fibre root. Colour measurements were carried out by using a Hunter colorimeter. The fluorescence spectra of un-pigmented hair obtained by the excitation at 290 nm show a peak at 356 nm [tryptophan (Trp)], and multi-peak emissions in the range from 395 to 500 nm. A significant variation in the Trp emission intensity at 356 nm vs. the intensity of emission in the 395–500 nm range was observed for hair collected from various individuals with yellow coloured hair producing stronger relative emission in 395–500 nm range. Quantitative measurements of coloration and the calculation of the Yellowness Index (YI) showed linear correlation between YI and the ratio of fluorescence intensities I_{440}/I_{356} . The spectra obtained by excitation at 320 nm showed the emission peaks at 395 nm (unidentified), 420 nm (N-formylkynurenine), 460 nm (kynurenine), and 495 nm (3-hydroxykynurenine), which are the products of oxidative or metabolic conversion of tryptophan. Un-pigmented, yellow hair showed a build-up of the fluorescence band corresponding to 3-hydroxykynurenine at 495 nm. The data also showed the fluorescence quenching effect of melanin resulting in the lowering of the fluorescence intensity of pigmented hair. The spectra obtained at various positions along the fibres demonstrated gradual photo-decomposition of hair chromophores during their lifetimes. This was indicated by a decrease of Trp fluorescence intensity, which was relatively fast ($8 \cdot 10^{-2}$ – $1.5 \cdot 10^{-3}$ [day⁻¹] as calculated for hair obtained from various individuals) for un-pigmented hair and slower for pigmented hair. A decrease in Trp emission was accompanied by an increase in the yellow coloration toward the ends of un-pigmented fibres.

* These abstracts appear as they were originally published. They have not been edited by the *Journal of Cosmetic Science*.

Roughness analysis of the skin as a secondary evaluation criterion in addition to visual scoring is sufficient to evaluate ethnic differences in wrinkles

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Visual scoring has been used to evaluate ethnic differences in skin wrinkling, but it is not sufficient to fully evaluate those differences in wrinkles. We examined whether both the roughness analysis of the skin and visual scoring are sufficient to characterize ethnic differences in wrinkles in Japanese, Chinese and German women. One hundred and five Japanese, 96 Chinese and 90 German age-matched women participated in this study. The severity of their wrinkles in the skin at two sites at the periphery of the eye was evaluated by visual scoring using a photoscale and by roughness values obtained from three-dimensional analysis of skin replicas. Slight but significant differences were scarcely observed between Japanese and Chinese women as well as between Japanese and German women at the same age group using the visual scoring method. However, significant and clearer differences among those ethnic groups were observed using the roughness analysis of skin replicas. Below the eye, significant differences among those ethnic groups were observed using both visual wrinkle scoring and roughness analysis. However, the extent of increased roughness values with age was relatively small compared with the increased wrinkle scores. These results show that roughness analysis is more sensitive than the visual scoring method when comparing ethnic differences in wrinkles. We conclude that roughness analysis of the skin is an important secondary evaluation criterion to visual scoring necessary to evaluate ethnic differences of wrinkles.

Electrometric assessment of the effect of a zinc oxide paste in diaper dermatitis

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Diaper dermatitis affects nearly 50% of infants as well as some bed-ridden adults particularly in the elderly people. This condition is induced by irritation and maceration, and

may be further exacerbated by *Candida* sp. colonization and infection. A key factor in the pathogenesis is the alteration in both the barrier function and the water-holding capacity of the stratum corneum. The purpose of this study was to assess the effects of an unmedicated zinc oxide-petrolatum paste and to observe for possible shielding and restoring effects on the water-holding capacity of the stratum corneum altered by diaper dermatitis. The paste appeared to load the hollow skin microrelief. It was inferred that this effect was responsible for a reticulated shielding effect. Compared with healthy skin and untreated diaper dermatitis, the application of the anhydrous paste resulted in a trend to normalize electrometric properties of skin reflecting the combination of transepidermal water loss and the water-holding capacity of the stratum corneum.

An evaluation of extracts of five traditional medicinal plants from Iran on the inhibition of mushroom tyrosinase activity and scavenging of free radicals

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This study aimed to evaluate the free radical scavenging and inhibition properties of five medicinal plants, including *Quercus infectoria* Olive, *Terminalia chebula* Retz., *Lavendula stoechas* L., *Mentha longifolia* L., *Rheum palmatum* L., toward the activity of mushroom tyrosinase using L-tyrosine and L-3,4-dihydroxyphenylalanine (L-DOPA) as the substrate. The methanol extracts of *Q. infectoria* and *T. chebula* showed strong radical scavenging effect in 2,2'-diphenyl-1-picrylhydrazyl (DPPH) assay ($IC_{50} = 15.3$ and $82.2 \mu\text{g mL}^{-1}$ respectively). These plants also showed inhibitory effects against the activity of mushroom tyrosinase in hydroxylation of L-tyrosine (85.9% and 82.2% inhibition, respectively). These two plants also inhibited the oxidation of L-DOPA similar to kojic acid as positive control ($IC_{50} = 102.8$ and $192.6 \mu\text{g mL}^{-1}$ respectively). In general *Q. infectoria* and *T. chebula* significantly inhibited tyrosinase activity and DPPH radical. Both activities were concentration-dependant but not in linear manner. It is needed to study the cytotoxicity of these plant extracts in pigment cell culture before further evaluation and moving to in vivo conditions.

Identification and determination butylmethoxydibenzoylmethane in the presence benzophenone-3 and ethylhexylmethoxycinnamate in sunscreen preparation

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The protection of sun radiation is a problem on global level for all living organisms on Earth. The need of people for the overexposure to the UV radiation led human population towards finding novel ways of protection of this kind of radiation, in form of cosmetic preparations applied on the skin. So far, the high values of protection factors of preparations and total block preparations with sun protection factor of 50+ were achieved. Physical and chemical filters which absorb radiation are constituents of these preparations. European Union has set regulations as which substances and in what amounts could be used as UV absorbers. American FDA (Food and Drug Administration) also gave its list of the most frequently used UV absorbers in the sunscreen products, as well as their declared concentrations. The most frequently used concentrations of UV filters in cosmetics is between 0.1% and 10%. Concentrations of UV filters in sunscreen products have to be monitored in order to ensure that they are not less from the declared levels, on which depends the efficacy and safety of the product. Butyl methoxydibenzoylmethane (BMDM) is used as a UV-A filter in suncare products. Optimized high performance liquid chromatography method for BMDM determination in the presence of other UV filters in suncare preparations is presented in this paper. Determination was performed on C₈ reversed phase using UV detection at 357 nm and isocratic mobile phase of acetonitrile and 0.5% phosphoric acid (70 : 30 v/v). Proposed method has limit of detection of 0.058 µg mL⁻¹, limit of quantification 0.193 µg mL⁻¹ and linearity correlation coefficient of 0.9989. Commercially

available products were analysed using the proposed method. All analysed samples complied with EU directives limit of BMDM content to no more than 5%.

Influence of concentration of fragrances on salivary α-amylase

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The objective is to reveal the influence of the concentration of fragrances on salivary biomarkers, which reflect the human stress system, in 15 female young healthy adults. *Lavandula officinalis* and *Citrus aurantium* were used as the test samples. Salivary biomarkers such as α-amylase activity (AMY), cortisol (CORT) and dehydroepiandrosterone (DHEA) were measured during baseline, inhalation and post-inhalation periods. Our results indicated that (i) a significant difference was not observed for the control and the 3 wt% test samples, however, the AMY was decreased by inhalation of the 1 wt% test samples ($P < 0.05$); (ii) AMY levels changed more significantly than did the hormone levels; (iii) a tendency of negative correlation was not observed between DHEA and CORT. It was considered that the time-course change of AMY might be a useful index of the inhalation of fragrances, which reflects the acute psychosomatic reactivity of humans.

