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Study of the applicability of vegetable oils in phytocosmetology

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Abstract

Vegetable oils are a class of natural products very frequently used in phytocosmetology. Natural remedies with antiaging action are very popular in our days. Harmfulness of natural compounds on the skin, is quickly observed by the 24-48 hour patch test skin irritation and erythema measurement. Changes in the concentration of melanin and sebum in the dermis, represent real parameters which give informations regarding the status of skin aging. These parameters were measured with the device Mexameter MX18 and Sebumeter MS 815. Peanut oil and olive oil induced a slight increase in levels of melanin, during the 28 days of study. Grape seed oil had a mean constant action. Argan oil and sesame induced a slight reduction in the concentration of melanin. It was also noted that the application of peanut oil and olive induced an increase in concentration in sebum. Argan oil, grapes oil, and to a lesser extent, sesame oil induced a lower level of sebum in the dermis.

Keywords: skin, phytocosmetology, vegetable oil, Mexameter, Sebumeter.

1.Introduction

Phytocosmetology is a new concept, which suggests the complexity of both medicinal and nonmedicinal plants used in the cosmetic industry.

This new findings of the modern society assigned to the medicinal plants reinforces their value as natural sources with polyvalent applications, having effect of disease prevention and treatment of physiological and pathological disturbances of several organs in the body, including skin ailments [1].

This concept is addressed to a complex level. Recent studies have developed several areas of action of phytocosmetology: the phytocosmetology of the skin, hair, legs, breasts, eyes, and phytocosmetology-phytobalneoterapy [1,2].

The phytocosmetology of the skin covers recommendations regarding the balance and normalization of skin type, from dry and fat, inducing a tendency to normal skin, maintaining skin hydration level, and skin elasticity, a keys for prevention and treatment of wrinkles , having an anti aging effect. This concept involves also a balance for the concentration in melanin [1,7] and prevention of striae gravidarum [3].

Antiaging products based on oily plant extracts have a skin-moisturizing role. The mechanism involves the maintenance of the lipidic film which prevents water loss, and the vitaminization of the skin together with an antioxidant effect [4,5].

In the present study there were observed five vegetable oils commonly used in the cosmetics area: arachis (peanut) oil (*Arachis hypogaea* L.), argan oil (*Argania spinosa* L.), olive oil (*Olea europaeae* L.),

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grape seed oil (*Vitis vinifera* L.) and sesame oil (*Sesamum indicum* L.).

In addition to their traditional use in cosmetic purposes and improvement of skin viscoelastic and hydration properties [6], recent studies support the idea that they could be an optimal environment for the dissolution of some chemical or natural liposoluble principles, with applicability on the dermic or even systemic level [7-11].

Peanut oil topical used of on the skin, can generate different forms of allergic reactions [12]. The oil should be avoided as precaution. Argan oil is used frequently in the treatment of skin infections [13]. Grape oil has wound healing potential [14].

The aim of the study is to outline the changes that occur on skin level after the application of vegetable oils for 28 days, on human subjects.

2. Materials and Methods

Vegetable oils were acquired from Ecocert Italia (peanut oil, argan oil), Agrocert Greece (olive oil), Vitaquell Germany (grape seed oil) and Manica Bucharest (sesame oil).

To the study had participated 10 women with healthy skin; age between 25-40 years.

They were informed about possible risks, according to Human Experiment and Ethics Committee.

Maintenance period was 28 days.

Irritation patch test

The vegetable oil was applied as occlusive bandage (20 mm x 20 mm, 1 ml oil).

Signs of skin irritation were observed visually after 24-48 hours in the forearm.

Variation of melanin and skin redness (erythema) It was used the device -Multiprobe Adapter System (MPA5) from Courage-Khazaka, Germany

Mexameter MX 18. Blank was an initial reading, before using the vegetable oil.

Sebumetry

It was used the device- Multiprobe Adapter System (MPA5) from Courage-Khazaka, Germany; Sebumeter MS 815.

3. Results and Discussion

In case of the patch test irritation was not observed for none of the subjects.

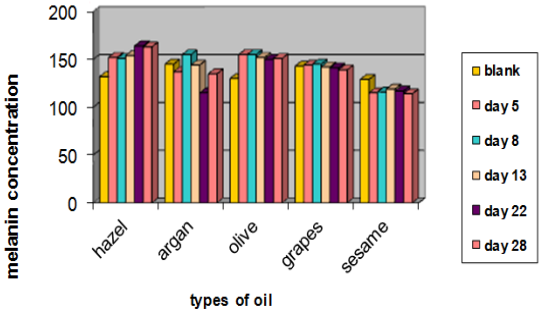

Figure 1. Variation of the melanin concentration

Peanut oil and olive oil induced a slight increase in levels of melanin, during the 28 days of study.

It was reported that olive oil decrease the risk for dermatitis. Olive oil also presented a protective effect against photocarcinogenesis in a mouse model of skin cancer [15,16].Values obtained, are following the recommendation of such vegetable oils in a number of limited dermo-cosmetic products for long term.

In the process of skin aging a physiological hyper pigmentation takes place, an increase in the amount of melanin. Anti-aging products are following exactly the remedies which have the ability to reduce the formation of melanin.

Grape seed oil had a mean constant action. It did not affect the concentration of melanin in the dermis.

In the literature it is reported that grape seed oil has an antihepatotoxic effect in rats.It was also found

That this oil decrease ethanol toxicity in mail rats [17,18].

Argan oil and sesame induced a slight reduction in the concentration of melanin. Skin protecting effects of argan oil (cures pimples, chicken pox pustules, present a nutritive effect against dry skin and hair) are well reported in the literature. Sesame oil was found to present positive effects in the recovery of skin lesions induced by mouse skin two-stage carcinogenesis model [19-21].

This findings lead to successful recommendation of such oils in anti-aging products.

There was no sign of erythema at any of the tested vegetable oils. It can be said that there are no signs of acute toxicity for a short period of time - 28 days. The group of Kull et al. showed that there is a link between the exposure to peanut oil in vitamin A and D preparations during childhood and some clinical symptoms that appear later due to peanut exposure [22].

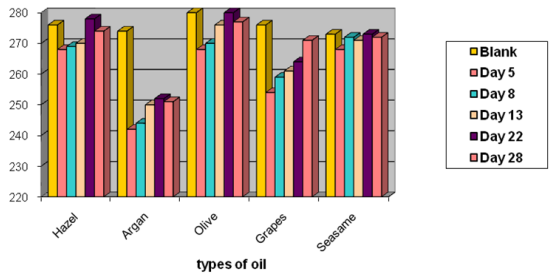

Figure 2. Variation of erythema

Argan oil, olive and grape slightly reduced the erythema; the peanuts and sesame maintained the physiological state of the skin. Argan, olive and grape oil can be incorporated in skin products with anti-inflammatory action.

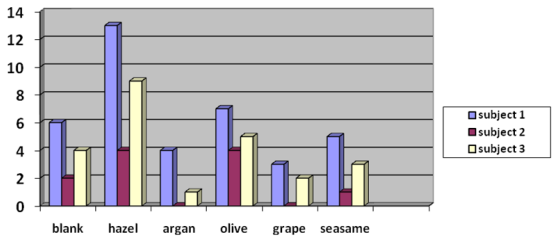

Figure 3. Variation of the sebum concentration ($\mu g/cm^2$)

It was noted that the application of peanut oil and olive oil induced an increase in the concentration in sebum. These oils must be used with attention in case of people with mixed and fat skin. Argan , respectively grapes oil, and to a lesser extent, sesame oil induce a lower level of sebum in the dermis. An explanation of this could be the fact that polyunsaturated fatty acids present in these oils soluble substances present in sebum, promoting their deepest penetration of the skin. This action may lead to a protective effect against dehydration.

Dehydration is a common phenomenon present in the general processes of aging.

4. Conclusion

The five types of vegetable oils taken in to study do not induce visible irritation in the patch test.

Peanut and olive oil induced a slight increase in the levels of melanin, during the 28 days of testing, namely from 132 to 163. Grape seed oil did not affect the concentration of melanin in the dermis during the study period. Argan and grapes oil induced a slight reduction in the concentration of melanin, leading to the idea of successfully recommendation of such oils in dermo-cosmetic products aimed to decrease the level of pigmentation.

Argan, olive and grape oil slightly reduced edema; they may be used primarily in skin preparations with anti-inflammatory action. Peanut and sesame oil did not affect the mechanism of appearance of erythema.

The sebumetric analysis of vegetable oils allowed us to classify oils into two categories. Category one- oils that induced an increase in the amount of sebum: peanut oil and olive oil. These oils can be recommend to people with dry skin. Category two- oils that induced a reduction in the amount of sebum: argan oil, grapes oil, and to a lesser extent, sesame oil. These oils can be recommended for mixed and oily skin.

This study also concludes that, for furtherer use, tested vegetable oils can be successfully incorporated with respect to active concentration and skin type in semisolid formulations with dermal application, both for their intrinsic action and also as environment of solubility for lipophilic chemical substances and plant extracts, as they show no irritation effect as revealed by the patch test.

Compliance with Ethics Requirements

Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human and/or animal subjects (if exists) respect the specific regulations and standards.

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