

# DERMATOLOGICAL APPLICATIONS OF OLIVE OIL

M<sup>o</sup> A. Ruiz, J. de D. Navarro, V. Gallardo

Departamento De Farmacia Y Tecnologia Farmacéutica.

Facultad de Farmacia, Universidad de Granada.

*Received: December 14, 1998*

*Key words: Olive oil, pharmaceutical applications, reviews*

---

## Synopsis

In this paper the bibliography of dermopharmaceutical preparations with olive oil is reviewed. In recent years it is evident that it is mainly the unsaponifiable fraction that is used and that the ozonation of this oil has increased considerably, together with that of sunflower oil.

---

## Riassunto

Nel seguente articolo viene fatta una revisione bibliografica di preparati dermofarmaceutici con olio di oliva. Negli ultimi anni si sono scoperte le proprietà della frazione non saponificabile dell'olio di oliva e i suoi usi. È stata aumentata inoltre la ozonificazione di questo olio con quella dell'olio di girasole.

## INTRODUCTION

Within the realm of cosmetic preparations, unguents comprise an important domain given their marked protective and emollient nature for the skin. An ideal unguent is compatible with the skin, stable, permanent soft, inert, and non-irritating. Oleaginous unguents contain fixed oil of vegetable origin in their composition.

The cosmetic use of vegetable oils can be complicated and in many cases there is a possibility of their acting as "attractives" that supposedly have surprising functions in cutaneous corrections (1).

The cosmetic interest of these vegetable oils resides primarily in obtaining the unsaponifiable fraction, since in topical applications this fraction activates the cutaneous metabolism in the zone of application, producing an emollient, hydrating, dermatoprotective, and photoprotective effect (2).

Table 1 gives the unsaponifiable content for various oils employed in cosmetics. In general, those most used are the least expensive ones and those with a high unsaponifiable proportion of the fat being extracted.

Olive Oil, apart from the interest in it due to its aforementioned high unsaponifiable fraction, can be

found in many dermatological preparation, as well as in the form of ozonated olive oil, obtained by combining it with ozone.

## OLIVE OIL: PHARMACEUTICAL AND COSMETIC APPLICATIONS

Olive oil considered officinal in most pharmacopoeias (3) is a slightly yellow liquid with a characteristic odour that easily goes rancid. It comprises distinct acids, such as oleic (65-80%), palmitic (7-20%), linoleic (4%), estearic (2-4%), miristic (1%) and occasionally lauric and arachidonic acids (4, 5). Olive oil is employed in the fabrication of many pharmaceutical preparations (6, 7) and cosmetics (8, 12) due to its unsurpassable quality in soap, creams, skin oils, liniments, and sunscreens preparations (13). It is also used in the preparation of Salicylic Oil and Camphorated Oil (14).

## OZONE AND OLIVE OIL

Ozone is a contaminating agent that can generate unsafe oxidizing compounds. It has been known as a powerful oxidant since its discovery by Christian Friedrich in 1840, capable of producing adverse effects in humans when inhaled in appreciable amounts. In small doses it has been shown to reduce the ventilatory function, increasing the permeability and reaction of the respiratory tree. It has also been observed to increase the endogenous mediators in inflamed cells.

It has been demonstrated that the damage caused by ozone when inhaled is directly related to the arachidonic acid of the cellular membranes in the lung, producing an increase in the leukotriene levels. Other researchers correlate exposure to ozone with a rise in the infiltration of neutrophils, inflammatory mediators, and cytokines.

Ozone passed through olive oil is converted into ozonid, the polymer of a long chain. Ozonated olive oil is thus obtained, with a final semisolid consistency, like vaseline, but preserving the odour of ozone.

**Table I**

### UNSAPONIFIABLE CONTENT

<i>Karité Lard</i>	3,5 - 12
<i>Avocado Oil</i>	3,0 - 10
<i>Soya Oil</i>	0,5 - 1,5
<i>Sesame Oil</i>	1,0 - 1,5
<i>Corn Oil</i>	1,5 - 3,0
<i>Rice Oil</i>	1,0 - 3,0
<i>Olive Oil</i>	0,6 - 1,2
<i>Peanut Oil</i>	0,2 - 0,9
<i>Castor Oil</i>	0,3 - 0,8
<i>Coconut Oil</i>	0,1 - 0,3

The process consists of sending a continuous flow of gas through the oil and takes several days (15). Ozonated olive oil is stable when kept under refrigeration, maintaining nearly all its potency in spite of having no stabilizers or preservatives. It can also be obtained as "Oil Sticks", or small cylinders, for implants. The amount of oil need is cut off and the implant is ready for use (16).

## **BIOLOGICAL ACTION AND THERAPEUTIC PROPERTIES OF OZONATED OLIVE OIL**

Ozonated vegetable oils contain a mixture of chemical compounds with considerable germicidal effect. The results of topical applications in dermatological diseases due to viruses, fungi, bacteria, etc. have been studied for years.

Ozonated Olive Oil has been utilized for skin treatments since the end of the 19th century, being particularly popular in the 1950s, which saw the appearance of many articles on the subject of its medical applications.

Currently, it is used in the treatment of both contact skin inflammations (dermatitis) and of atypical ones such as seborrhoea, etc. It has also been shown to be of use in skin infections caused by *Staphylococcus*, as well as in cellulitis, impetigo, folliculitis, furuncles, and carbuncles, infections of the sweat glands and of the nail bed, and in numerous fungal infections such as "athlete's foot", primarily due to *Epidermophyton*, *Candidiasis* and *Pityrosporum*. Its main use is undoubtedly for infections produced by herpes simplex.

Also worth noting is its employment in the treatment of acne and other skin-related problems such as psoriasis or inflammations caused by intoxication of a drug. It is also used to prevent secondary postoperative infections. Finally, Cuban researchers (Ozone Research Center, La Havana) have used it in capsules for treating gastroduodenal ulcers, gastritis, etc. (16).

## **OZONE AND SUNFLOWER OIL**

"OLEOZON", which is ozonated sunflower oil, deserves special mention.

Cuban investigators (op. cit. 16) have mainly used it, as it is more economical and easily obtainable. OLEOZON has a different consistency since olive oil has a spiral structure that allows the ozone to place itself in the free spaces in the spiral.

OLEOZON has been employed to treat alveolitis (17), dyschromia (18), gynaecological problems, subprosthetic stomatitis (19), giardiasis (20, 21), pioderma (22), haemorrhoids, gingivostomatitis and dermatological problems (23).

## **ACKNOWLEDGEMENTS**

We thank Christine Marie Laurin for translating the original manuscript into English.

### **Author Address:**

*Dr. M.A. Ruiz*

*Dpto Farmacia y Tecnologia Farmacéutica.*

*Facultad de Farmacia, Universidad de Granada.*

*Campus de Cartuja s/n, 18071, Granada, Spain.*

*Tel.: + 34.958.243904*

*Fax: + 34.958.248958*

*E-mail: adolfina@platon.ugr.es*

## REFERENCES

1. **Charlet E. (1996)** Cosmética para farmacéuticos. *Ed. Acribia, Zaragoza, Spain*, P 63.
2. **Pons L. y Parra J.L. (1995)** Ciencia Cosmética. Bases fisiológicas y criterios prácticos. Ed. Consejo General de Colegios Oficiales de Farmacéuticos. *Madrid, Spain*, P 251.
3. **Real Farmacopea Española (1997)**, 1a ed. Ministerio de Sanidad y Consumo. *Madrid, Spain*, P 377.
4. **Ruiz M.A. y Sellés E. (1982)** Estabilidad del Aceite de Oliva, *Cien & Ind. Farm.*, 386-389.
5. **USP XXIII NF 18 (1995)** Ed. The United States Pharmacopoeia, Unite States Pharmacopeial Convention Inc., *Rockville*, P 2274.
6. **Oruezabal M.L. y García M.J. (1977)** Formulario Magistral. *Colegio Oficial de Farmacéuticos de la Región de Murcia, Murcia, Spain*, P. 65.
7. **Janistyn H. (1974)** Taschenbuch der Modernen Parfümerie und Kosmetik. *Wissenschaftliche Verlag gesellchaft. Stuttgart*, P 265
8. **Janistyn H. (1978)** Handbuch der Kosmeticka und riechstoffe, *Satz und Druck, Germany*, P 363.
9. **Vandenbussche L. and Braekman P. (1973)** Le grand manuel ef formulaire Cosmetologique, *3a ed., Menin*, P 107.
10. **J. Smid-Korbar, J. Kristl and M. Stare (1990)** Efficiency and Usability of Silicone Surfactants in Emulsion. *Int. J. Cosmet. Sci.* 12: 135-139.
11. **Inventario de ingredientes cosméticos (1996)**. *Ministerio de Sanidad y Consumo. Madrid, Spain*, P 306.
12. **Martin Dale (1989)** The Extra Pharmacopoeia. *Edit. J.E.F. Reynolds 29 de. The Pharmaceutical Press. London* , P 1596.
13. **Ruiz M.A., Sellés E. and Gallardo V. (1986)** Influencia del excipiente en aceite y lociones antisolares. El monitor de la farmacia y la Terapéutica, **219**: 263-265.
14. **Del Arco Ortiz de Zàrate et al. (1992)** Formulaciòn Magistral de Medicamentos. *Colegio Oficial de farmaceuticos de Vizcaya, Spain*, P 50.
15. **The Ozone Gateway**. <http://www.o3zone.com>
16. **Sartori H.E.** Ozone, The Eternal Purifer of the Earth and Cleaner of All Living Being,
17. **Cruz O., Menéndez S., Martínez M.E., Clavera T. (1997)** Application of Ozonized Oil in the Treatment Of Alveolitis. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
18. **Castañeria E.T., Cruz O., Menéndez S. (1997)** Dyschromia Treated With Oleozon. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
19. **Lemus L., Ordaz E., Rodrigues E. (1997)** Application of Oleozon in the Treatment of Subprothesis Stomatitis. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
20. **Piñol F., Cedeno N., Diaz W. (1997)** Therapy Effects Of Ozonized Oil (Oleozon) in the Treatment of Giardiasis. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
21. **Gonzàles M.E., Menéndez S., Cedeño N., Orvera G., Diaz W. (1997)** Ozonized Oil (Oleozon) in the Treatment of Children Suffering of Giardiasis. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
22. **Alvarez R., Menéndez S., Peguera M., Turrent J. (1997)** Treatment of Primary Pioderma with Ozonized Sunflower Oil. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*
23. **Falcòn L., Simòn D., Menéndez S., Moya S., Garbayo E., Diaz W. (1997)** Experiences of Nine Years using Ozonized Oil in Dermatology. *2nd Symposium on Ozone Applications, La Habana, Cuba, Marzo.*