

LEXICON

Volume XXIV

VEVY EUROPE

Nr 1 November 2009

Xalifin-15 and thermal waters

SKIN HEALING PRINCIPLES OF THERMAL WATERS
USING STABLE AND EUDERMIC EMULSIONS



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The dermatological properties of thermal waters have recently been re-evaluated and brought to the attention of the demanding users of functional cosmetics. By means of a simple technique, and with the help of Xalifin-15, it is possible to obtain active, stable, non greasy, highly penetrable emulsions.

Xalifin-15, which is already well known for its emulsifying properties, allows us to produce stable emulsions, even when starting from a continuous phase, i.e., water, provided that it is highly saline. This leads to the formation of an emulsion which, although not refined by further homogenization, cools at room temperature and results in a stable product.

One hundred kilos of this cream are produced with 15-20 Kg of Xalifin-15 and 85-80 Kg of thermal waters. Therefore, 80% of the resulting solid emulsion is made up of an active component, while the remaining 20 % is made up of a bioemulgoid that also works as an excipient deep below the skin's surface.

The emulsions that are obtained can safely be

used on sensitive or irritated skin as well as on skin suffering from various dermatological conditions, and on the skin of babies which is often subject to local reactivity.

Therefore, the activity of the emulsion varies depending on the characteristics of the ther-



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International information on dermo-pharmaceutics cosmetics and toiletries

Publisher: VEVY EUROPE, via Semeria 16^A, 16131 Genova, Italy. **Managing Editor:** Giorgio Rialdi. **Deputy Editor:** Raffaele Rialdi. **Editorial and Advisory Boards:** Skin Applied Sciences Associates (SASA); **Copyright** © 1984-2009 by Vevy Europe S.p.A. All rights reserved. Texts are original and registered; no part may be reproduced in any manner or by any



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Associato all'Unione Stampa Periodica Italiana

Printed by by Morino Grafica Scrl — Genova, Italy

Xalifin-15 (Vevy codex 02.0151)**Xalifin-15 POB-free (Vevy codex 02.4590)**

The first and innovative emulsifier non toxic for skin enzymes (*Bioemulgoide*).

An effective, powerful and safe answer to your emulsifying problems. With Xalifin-15 creams and lotions stay stable, even with the most difficult materials to emulsify

Il primo emulsionante innovativo, non tossico per gli enzimi cutanei (*bioemulgoide*).

Una risposta sicura, potente ed efficace ai vostri problemi di emulsione.

Con Xalifin-15 le creme e i latti rimangono stabili persino con le sostanze più difficili da emulsionare

mal water source.

However, it must be kept in mind that the hydrotherapeutic activity of any given type of water cannot be assessed on the basis of its mineral content or on the quality of the mineral content alone. It is beyond a doubt that thermal water acts at skin level. The dermatotropic activity that many thermal waters themselves exert, even without any particular carriers, can easily be verified and not only empirically, and this activity cannot be solely attributed to the mineral content of these waters.

We may therefore obtain emulsions that exert a more medicamentous action. The effects that some waters have on various conditions, such as itchiness, moist eczemas (some known thermal water sources are effective even in acute, chronic or relapsing eczema), neurodermatitis, plaque psoriasis, keratosis, follicular seborrheic dermatitis, pruriginous chronic dermatitis occurring in those affected by arthritis or hyperuricemia, and a long list of others, is certainly well known. Similarly, lenitive, non-irritating cosmetologic emulsions can be prepared which would therefore be more broadly and freely available.

➤ **Xalifin-15 e acque termali** I principi dermocrativi delle acque termali veicolati con emulsioni stabili ed eudermiche

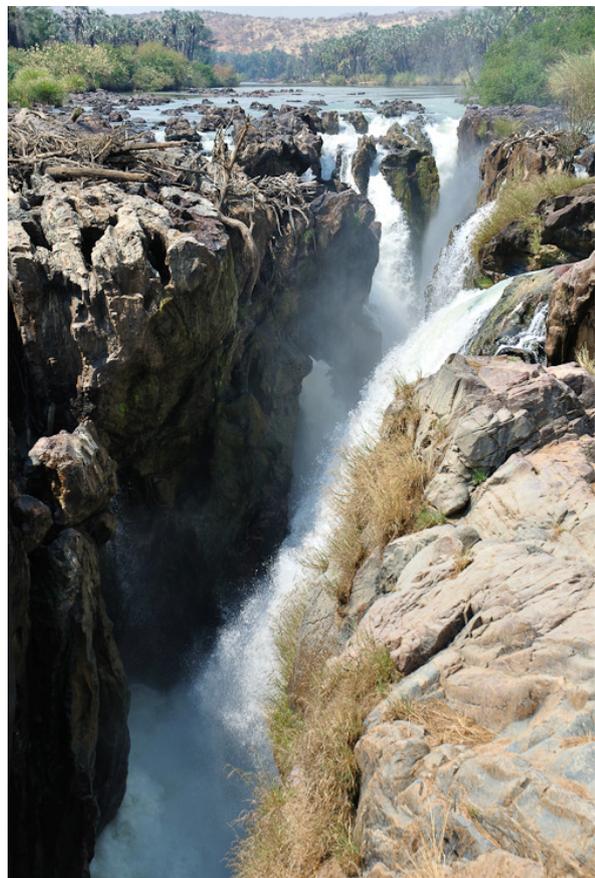
Le proprietà dermatologiche delle acque termali sono state recentemente rivalutate e portate all'attenzione dell'esigente utilizzatore di cosmetici funzionali.

Attraverso una facile tecnica è possibile ottene-

re da acque termali, con l'ausilio dello Xalifin-15, emulsioni attive, stabili, prive di untuosità, di alto potere penetrante. Lo Xalifin-15, già noto per le sue proprietà emulsologiche, consente di ottenere emulsioni stabili anche partendo da una fase continua (l'acqua) che abbia un contenuto salino elevato. Si forma un'emulsione che, anche se non raffinata con ulteriore omogeneizzazione, dà luogo per spontaneo raffreddamento in temperatura ambiente, ad un prodotto definitivamente stabile. Cento chilogrammi di questa crema si ottengono con 15-20 Kg di Xalifin-15 e 85-80 Kg di acque termali.

Si costituiscono in tal modo delle emulsioni solide in cui la componente attiva rappresenta l'80%, mentrèché per l'altro 20 % esse sono costituite da un bioemulgoide che assolve anche il compito di veicolo in profondità. Le emulsioni così ottenute possono essere destinate con tutta tranquillità anche a pelli sensibili o colpite da stati irritativi e situazioni dermatologiche differenti, come anche all'epidermide infantile, terreno fertilissimo di reattività locale. L'emulsione non fa dunque che rinchiudere una attività che varia con il variare delle caratteristiche della fonte.

Va comunque tenuto presente che l'attività idroterapica di un'acqua non può essere valutata in ragione del suo mero contenuto minerale



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dubbio che esista un'attività a livello cutaneo delle acque termali. L'attività dermatropa che diverse acque termali, già di per sé, senza veicolanti particolari, esplicano, è un fatto ben riscontrabile non solo empiricamente, e non si giustifica pienamente con il solo contenuto minerale.

Potremo pertanto ottenere emulsioni ad azione più propriamente medicamentosa: sono note le azioni di certe acque nel prurito, negli eczemi umidi (alcune note fonti sono efficaci persino negli stadi acuti o cronici riacutizzati dell'eczema), nelle neurodermiti, nella psoriasi volgare, nelle cheratosi, nelle dermatiti seborroiche follicolari, nelle dermatosi croniche pruriginose dell'artritico o dell'uricemico, e l'elenco non finisce certamente qui. Analogamente, possono essere preparate emulsioni di carattere cosmetologico, ad azione lenitiva, antiirritativa cutanea e dunque di maggior diffusione e di libero consumo.

The role of fibronectin in the healing of a skin wound

The healing process of a skin wound is an ideal model to study fibronectin functions.

New light was recently shed on the role of this glycoprotein in the sequence of events which enable reconstitution of a wounded tissue, skin in this case. This further supports the dermatopharmaceutic as well as cosmetic use of Dermonectin, as a fibronectin-stimulating factor. Fibronectin, one of the components of the clot which is formed in a wound, acts as chemotactical factor for monocytes. These cells are attracted by fibronectin fragments containing the domains which can bind to cellular surface proteins. It is similar to the activity of collagen and elastin fragments, but also stimulating fibroblast and endothelial cell movements. For its binding capacity, fibronectin probably coats the debris present in the wound, denaturated collagen molecules, DNA, fibrin and actin molecules, as well as bacteria, and enables phagocytosis by macrophages. Though not directly acting as opsonin

or being provided by a very weak direct opsonizing activity, it boosts the action of other systems, such as the monocyte phagocytosis process (activity which does not belong to collagen or elastin).

Fibronectin Mechanism: a Receptor

Fibronectin, by simultaneous interaction with cell surface and extracellular matrix components (such as collagen, heparin and fibrin) promotes migration of epidermal cells towards wound lips and fibroblasts and capillaries growth. Its role should be to provide a proper support for cell movement. Finally, it is deemed that fibronectin constitutes a warp for matrix formation and an essential support for the activity of myofibroblasts which determine wound contraction. The innumerable interactions between cells and fibronectin which take place during the healing of a wound prompted research on the receptors, located on the cell surface, which enable such interactions. One of them, with high affinity, was isolated,

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cloned and identified in many cell types. This fibronectin receptor belongs to the large family of integrins, glycoproteins consisting of an α chain of 142-180 kD and of a β chain of 95-130 kD. Such α and β chains are always assembled in the plasma membrane and have a large extracellular and a smaller cytoplasmatic domain. Depending on the specific α and β cells contained, integrins can bind to fibronectin, as well as to numerous other cells, such as collagen, laminin and vitronectin. The presence of fibronectin receptors was studied in the pig skin. Using specific antibodies for these receptors it was observed that, under normal circumstances, they are scarcely present in the epidermal basal cells, while they are more abundant at the level of hair follicle cells, of eccrine gland myoepithelial cells, of smooth muscle cells of hair erectors, of endothelial cells, of pericytes and vasal smooth muscle cells. During the wound healing process, when

Dermonectin (Vevy codex 18.1926)

The first effective oligomer precursor of fibronectin which, as such, really help in increasing skin firmness and resiliency

Il primo oligomero efficace precursore della fibronectina che, come tale, aiuta realmente ad incrementare la compattezza e l'elasticità cutanea

the granulation tissues have formed, fibronectin receptors can be identified in fibroblasts, and the interaction between these cells and the extracellular matrix fibronectin was confirmed by electron microscopy studies. Subsequently, when the wound coarcts, this process is made possible by the complex which forms between fibronectin receptors



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and the fibrils of this protein, which, like a network, envelops fibroblasts and allows transmission of their contraction. In addition, the fibronectin receptors of integrin β chain are present in the migrant, basal and suprabasal cells of the epidermis, and this phenomenon is not limited to the wound, but also extends beyond its edges.

Fibronectin and its Receptors: an Active Intervention. Then, after reconstitution of a normal basal membrane, both fibronectin and its receptors decrease considerably, and their disappearance determines and confirms the hypothesis of their active intervention in the wound healing process. Concluding, even though the healing of a wound requires the coordinated occurrence of numerous and not yet completely discovered events, fibronectin and its receptors are likely to play the following two major roles:

1. they allow migration of epidermal cells which might use fibronectin receptors to move on the extra-cellular matrix rich in this glycoprotein;
2. they enable fibroblasts, through the network formed by the complex between fibronectin and its receptors on the surface of such cells, to cause contraction of wounded tissues.

Italian version will be published in Lexicon 2, 2009