Cosmetic products for Atopic Dermatitis with natural mineral water from Termas de São Pedro do Sul

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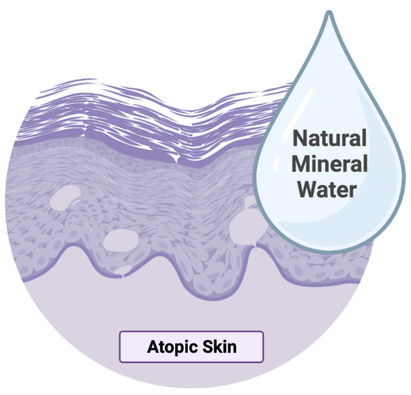
Introduction



Atopic dermatitis (AD) is a chronic and recurrent **inflammatory skin disease**, frequently associated with atopy. It is a chronic pruritic and inflammatory dermatosis, which progresses through crises. **AD therapy** aims to **control symptoms**, which includes the use of **adjuvant products that promote skin hydration** and improve its protective **barrier function**.

Bioactive properties of thermal waters have motivated their use in the **prevention and treatment of various skin conditions**, leading to their commercialization in the form of vaporizers or as ingredients of other cosmetic products.

Aim: Rational design, stability, and potential user evaluation of three innovative cosmetic products (a cleansing stick, a supplemented thermal water spray and a moisture lotion) for Atopic Dermatitis management using São Pedro do Sul thermal water as the core ingredient.

Materials & Methods

Basic criteria for cosmetics development were: **minimalism**; **eco-friendly**; **easy to use**; **innovation in texture or presentation**; **long lasting**; **protection of the skin's microbiome** (maintain barrier properties).

Cosmetics stability was evaluated through **centrifuge test** (3000 RPM, 30min), **cycle test** (4ºC and 40ºC, 4 weeks), **accelerated stability** (room temperature, 5ºC, 40ºC and light) and by monitoring the **organoleptic characteristics** over time.

Three **focus groups** with **25 subjects** (only 43,3% had a dermatologist diagnostic to atopic dermatitis) were performed to assess **potential users' perceptions** regarding the portfolio of products.

The ***in vivo*** **test** of cleansing stick was already assessed in **15 subjects** with inclusion criteria (Age: 18-65 years old, Gender: both, 100% Atopic skin tendency, SCORAD >8, Subjects presenting visible areas of dry skin (face, hands or elbows)). Protocol previous authorized by ethics comittee.

Product	Active cosmetic ingredients	Core ingredient
Cleansing Stick	• Anionic surfactants (Sodium Cocoyl Isethionate) • Emollients (Butyrospermum Parkii (Shea) Butter) • fatty esters of vegetable origin (Capric/Caprylic Triglycerides); • Natural wax (Cera Alba).	
Moisturizer Lotion	• fatty esters of vegetable origin (Capric/Caprylic Triglycerides); • actives that repair the skin barrier (Niacinamide); • functional ingredients that mimic natural moisturizing factor (Pentylene Glycol, Glycerin, Fructose, Urea, Citric Acid, Maltose, Sodium PCA, Sodium Chloride, Sodium Lactate, Trehalose, Allantoin, Sodium Hyaluronate, Glucose); • vegetable oils (grape seed oil).	
Supplemented Thermal Water	• humectants (Glycerin); • skin repairers (Panthenol); • antioxidants (Tocopherol); • prebiotics (Propylene Glycol, Water, Arctium Lappa Root Extract).	

Results & Discussion

Product(s)	Characteristics	Organoleptic characteristics and pH	Stability	Focus Group and in vivo
Cleansing Stick	• is made of mild surfactants for **gentle, hydrating cleansing action.**	• Odor: none • Color: white • Aspect: solid • pH=4.5-5.5	• Positive performance in the cycle testing (4º and 40ºC, 4 weeks) and **maintained** their **organoleptic characteristics** throughout. • The cleansing stick performs well in accelerated stability.	• The participants **liked** the idea of using **thermal water as the core ingredient** concept of the products. • The **most appreciated** product was the **moisture lotion**, while the **cleansing stick** was the **less**. • The participants reported not usually using special cleaning water and, therefore, they mainly react with surprise. • The participants suggested changes in the odour of products which did not please the majority, **confirming that consumers seek perfumed cosmetics although they may increase the risk of irritation**.
Moisturizer Lotion	• has soft emollient composition with an advanced texture in a **spray format** (easier application)	• Odor: none • Color: pearly-white • Aspect: fluid • pH=4.5-5.5		
Supplemented Thermal Water	• with hydrating ingredients with a **soothing and refreshing** action.	• Odor: none • Color: transparent lightly white • Aspect: liquid • pH=4.5-5.5		

All products were developed with **appropriate skin feel for application in atopic skin**. Microbiome-compatible, hydrating, and emollient ingredients were chosen.

The ***in vivo*** **results** suggest that, **after 28 days of application**, the product "**cleansing stick" has the capacity to improve the skin condition associated to atopic dermatitis** and at the same time is capable of **increase skin hydration level and renew the skin due to its exfoliating capacity**. Moreover, 86,7% of the subjects would like to continue to use the product.

Conclusion

The development of a cleansing stick, a supplemented thermal water spray and a moisture lotion with Sao Pedro do Sul Thermal Water for atopic dermatitis was successfully achieved.

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