

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

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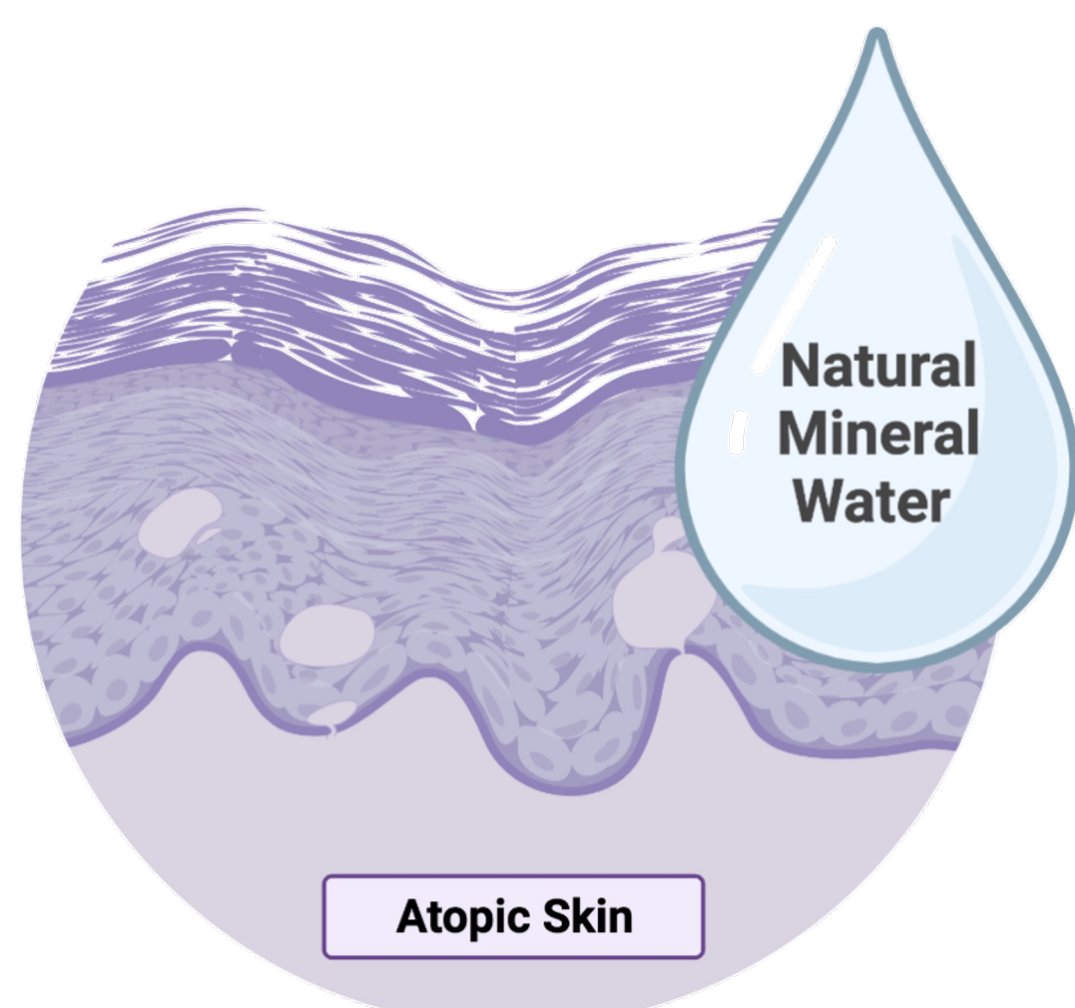
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## Introduction

**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** (4°C and 40°C, 4 weeks), **accelerated stability** (room temperature, 5°C, 40°C 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 committee.

Product	Active cosmetic ingredients	Core ingredient
<b>Cleansing Stick</b>	<ul style="list-style-type: none"> <li>Anionic surfactants (Sodium Cocoyl Isethionate)</li> <li>Emollients (Butyrospermum Parkii (Shea) Butter)</li> <li>Fatty esters of vegetable origin (Capric/Caprylic Triglycerides);</li> <li>Natural wax (Cera Alba).</li> </ul>	
<b>Moisturizer Lotion</b>	<ul style="list-style-type: none"> <li>fatty esters of vegetable origin (Capric/Caprylic Triglycerides);</li> <li>actives that repair the skin barrier (Niacinamide);</li> <li>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);</li> <li>vegetable oils (grape seed oil).</li> </ul>	
<b>Supplemented Thermal Water</b>	<ul style="list-style-type: none"> <li>humectants (Glycerin);</li> <li>skin repairers (Panthenol);</li> <li>antioxidants (Tocopherol);</li> <li>prebiotics (Propylene Glycol, Water, Arctium Lappa Root Extract).</li> </ul>	

## Results & Discussion

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

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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