BiotecnIA
Biotecnoloxía Industrial
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Grupo de investigación EQ2
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EXPLORING MEDICINAL MINERAL WATER-BASED PRODUCTS FOR SKIN CONDITIONS AGGRAVATED BY FACE MASKS

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INTRODUCTION

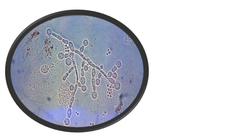
Galicia has more than 300 springs distributed throughout the territory. Specifically, in Ourense there are numerous pools and fountains whose waters are suitable for the treatment of multiple ailments, from dermatological to respiratory. With the appearance of COVID-19, face masks have become an indispensable complement. However, the barrier that protects us from the virus, favors the proliferation of undesirable microorganisms that aggravate certain skin pathologies.

This work is focused on alleviating the effects of facial masks such as dermatitis, acne and psoriasis, through the development of a natural product based on mineral-medicinal water (MMW). Namely, it seeks to transfer the antimicrobial property of certain natural compounds present in olive pomace to the waters through the formulation of microparticles (MP).

MATERIAL AND METHODOLOGY

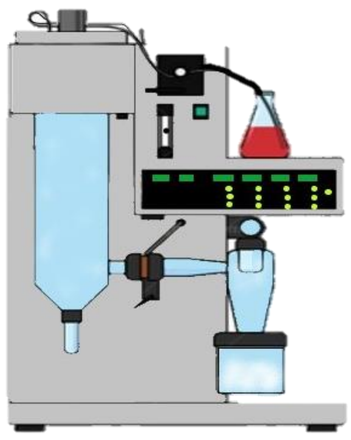
1. Antimicrobial activity of phenolic compounds from olive pomace (POP) against:

- *Candida albicans* — ***Psoriasis***
- *Staphylococcus aureus* — ***Dermatitis***
- *Staphylococcus epidermidis* — ***Acne***



2. Selection of microparticle carrier

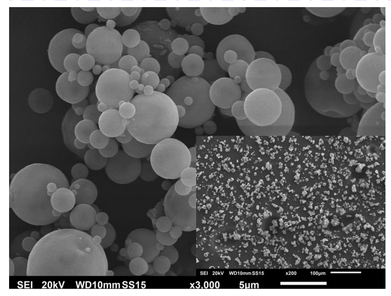
- Mannitol
- Alginate
- Carrageenan



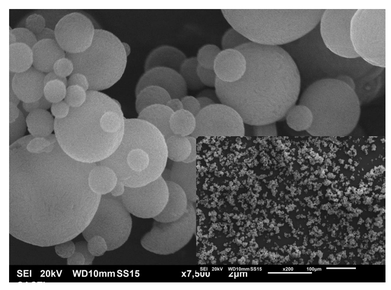
3. Formulation of bioactive microparticles

- MMW + POP

Volume: 50 mL
Carrier (1%)
Tª inlet (°C): 103
Aspiration (%): 100
Pump (%): 30
Q-Flow (%): 30-40



Control MP Mannitol



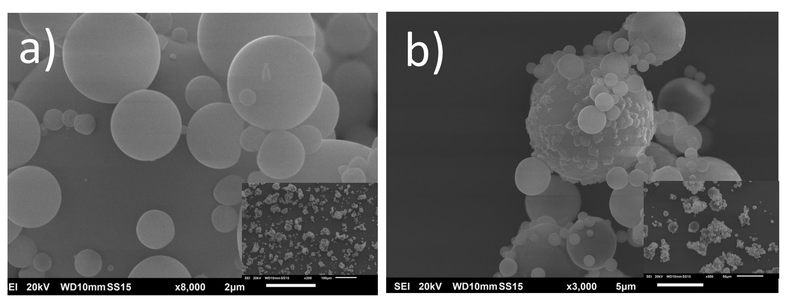
MMW + POP

RESULTS

The water from the Baniño spring is **weak mineralized** with a low content of Na, K, Fe, Mg, Mn, Si, Al, Cr, Cu, Zn, Se, Mo, Cd, Pb, chlorides, nitrites, nitrates, phosphates and sulfates. However, the **elements** shown in the table and related to their **thermal origin** stand out.

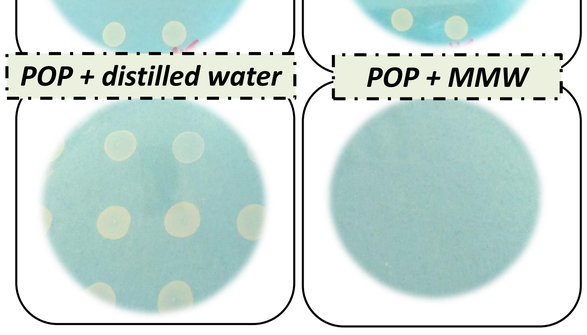
Physicochemical analysis of MMW	
Temperature	25 ± 1 °C
pH	7.9 ± 0.1
Dry residue (180 °C)	246.0 ± 11.3 mg/L
Li	0.5 ± 0.0 mg/L
Sr	51.5 ± 0.7 µg/L
As	34.0 ± 1.4 µg/L
Rb	14.0 ± 0.0 µg/L
Fluorides	8.0 ± 0.0 ppm

Carrier	Yield (%)
Mannitol	25.14 ± 3.60
Alginate	18.38 ± 0.87
Carrageenan	14.29 ± 0.90
MMW + Mannitol	**29.42 ± 4.28**



SEM images of control MP with carriers a) alginate and b) carrageenan

Antimicrobial activity of POP



CONCLUSIONS and FUTURE TRENDS

- A synergistic effect is observed between medicinal mineral water and phenolic compounds.
- The antimicrobial effect of POPs is enhanced when MMW is used as a substrate instead of distilled water.
- Using Milli-Q water as solvent, mannitol was the best carrier for formulating the microparticles.
- The combination of MMW as solvent, and mannitol as carrier, had a positive effect on the production yield.
- These results allow exploring new dermatological therapies by combining natural compounds and MMW-based microparticles.

ACKNOWLEDGMENTS

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