Utilization of *Trametes versicolor* biomass for functional edible films production: a bioprocessing scheme based on cheese whey valorization

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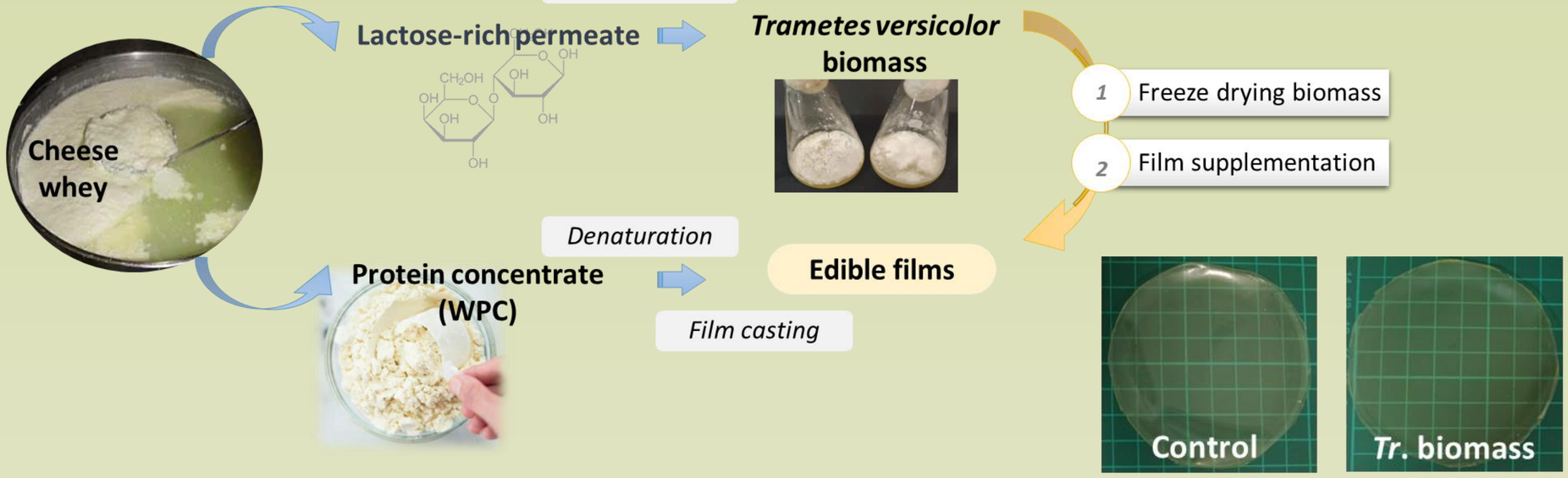
Introduction

The biotechnological conversion of cheese whey into valuable products, through microbial fermentations utilizes only the lactose stream, whereas the protein fraction remains unexploited. A holistic valorization scheme could be establishes through the valorization of both by-product streams and the generation of new products that will be re-introduced in the food supply chain.

In this study, *Trametes versicolor*, a non-edible medicinal mushroom isolated from Kefalonia island, was employed in submerged fermentations using the lactose stream of cheese whey, whereas the protein one was utilized for edible films production. Subsequently, whey protein films were supplemented by the freeze-dried biomass of the medicinal fungus. The effect of biomass addition on the physical and functional properties was evaluated.

Experimental set-up

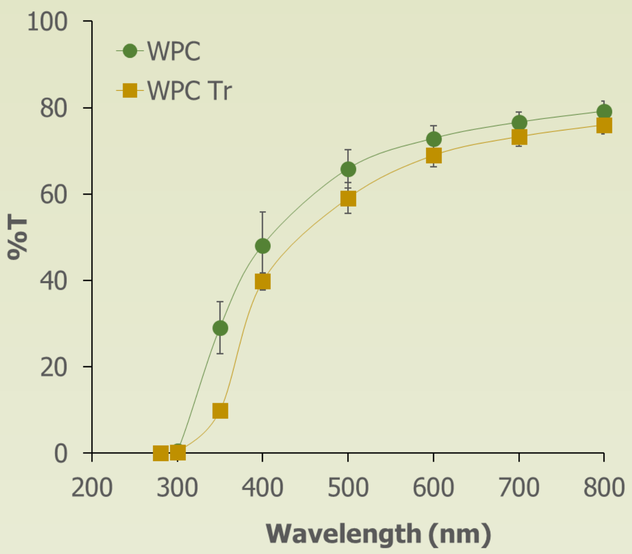


Physical & functional properties:

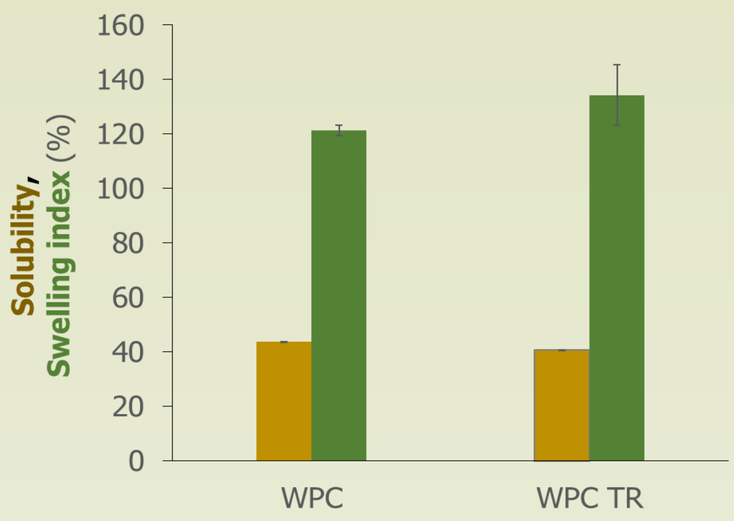
- ✓ Solubility
- ✓ Swelling index
- ✓ Transparency
- ✓ Antioxidant capacity

Results & Discussion

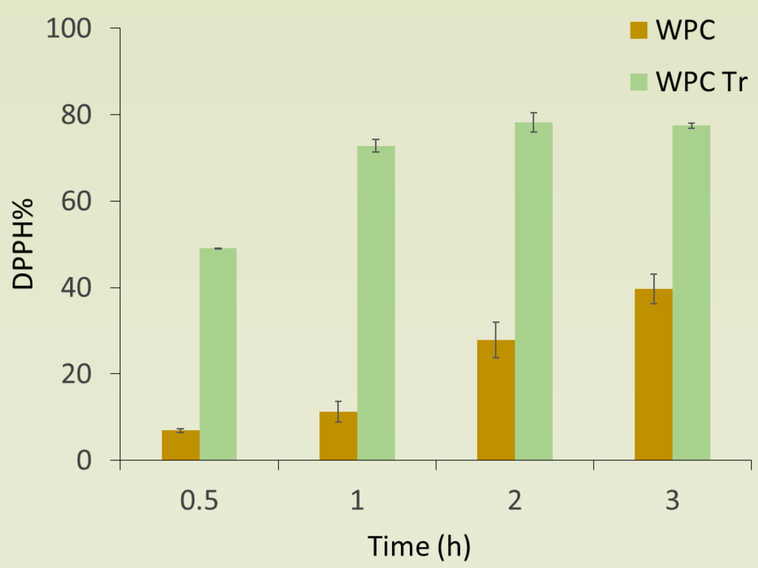
Transparency



Solubility & Swelling index



Antioxidant activity



Conclusions

- ✓ Physical properties of films supplemented with fungal biomass were identical to the control films
- ✓ Antioxidant activity of edible films was increased by the addition of *Trametes versicolor* biomass
- ✓ Films presented a time-dependent DPPH radical scavenging activity showing a maximum of 78.3% at 2 h
- ✓ This study presented the integrated valorization of cheese whey towards the development of edible films with antioxidant properties

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