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Optimization of the conditioning and drying stages of table olive by-products to obtain new powdered ingredients

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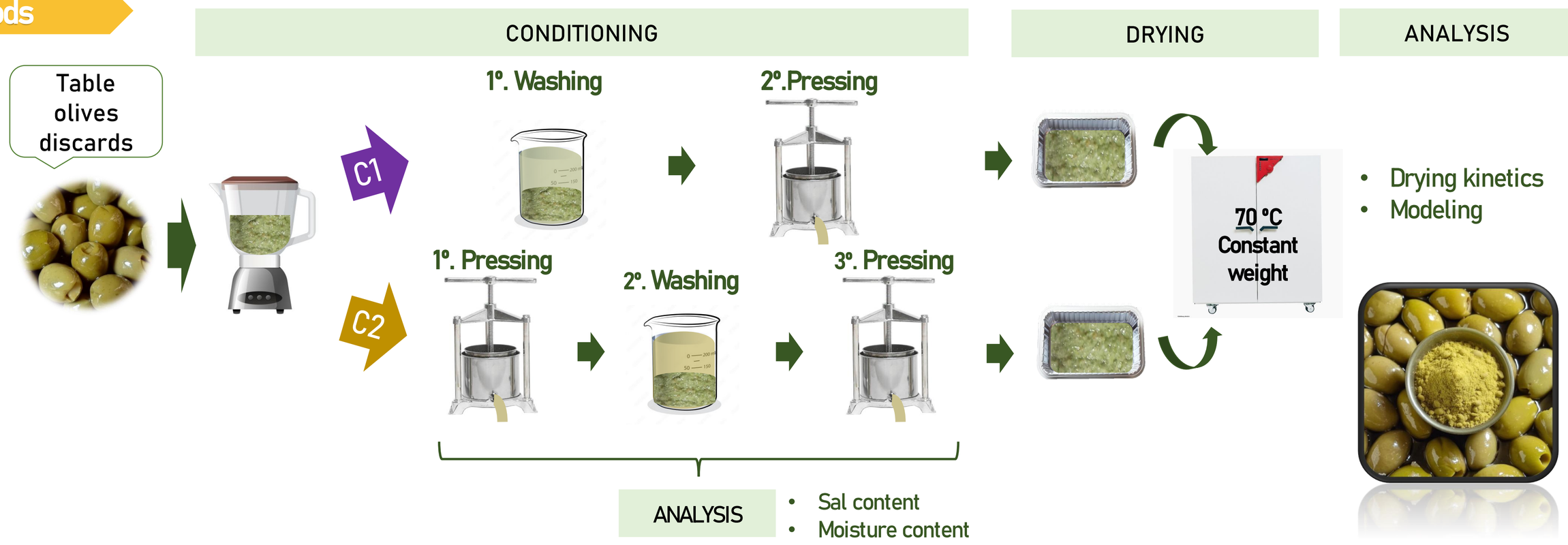
Introduction

During table olives production, around 90-150 tons of fruit discards are generated as a consequence of the mechanical action of the different processing stages or due to defects in the external quality of the fruit. These olive discards end up being used as an animal feed supplement, an energy source or a fertilizer. However, these by-products contain interesting components such as polyphenols and monounsaturated fatty acids, so they can be an excellent raw material for obtaining new ingredients. However, table olive by-products also have a high salt content that could make their subsequent incorporation into food products difficult[1].

Aim

The objective of the study is to optimize the conditioning stage prior to the drying process and to study the drying kinetics for obtaining new powdered ingredients from by-products of the table olive industry.

Methods



Results & Discussion

CONDITIONING

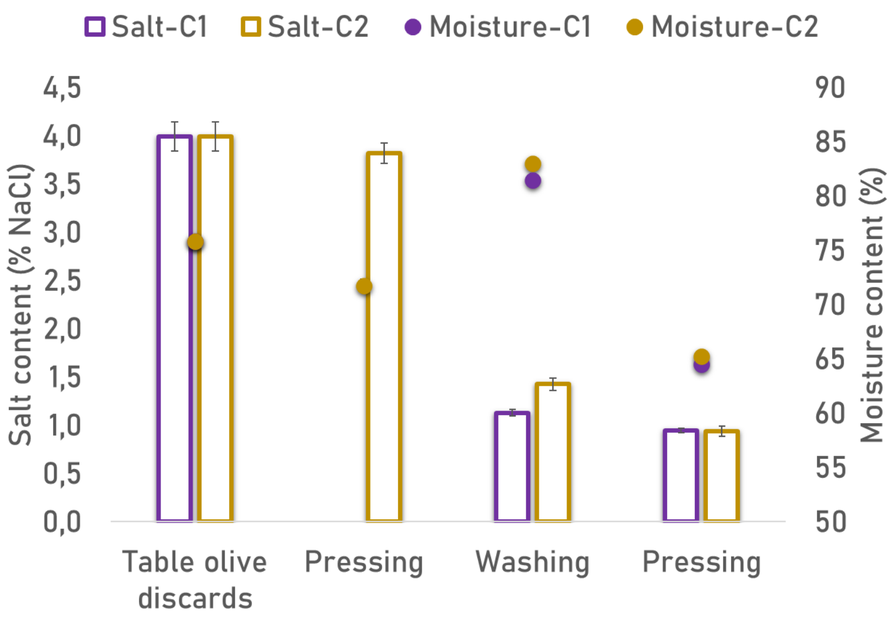


Fig. 1. Salt and moisture content of the olive paste in the different stages of the conditioning process.

Both conditioning methods reduced the salt content by up to 76 % and the moisture content by up to 14 %.

DRYING KINETICS AND MODELING [1,2,3]

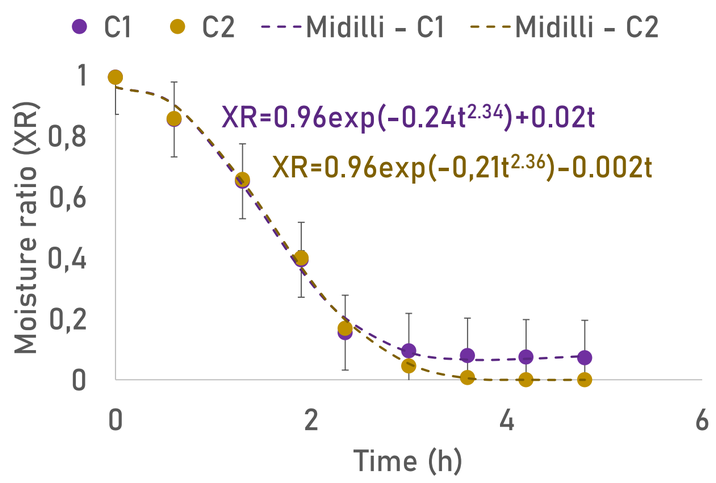


Fig. 2. Moisture ratio as a function of time for each conditioning. Non-linear fitting of the Midilli kinetic model.

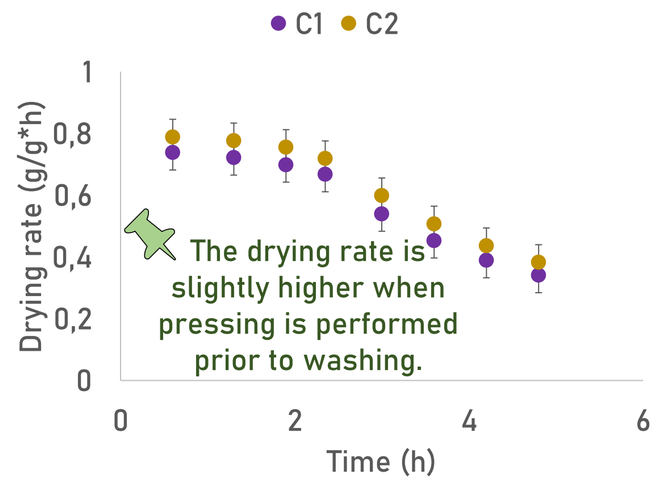


Fig. 3. Drying rate as a function of time for each conditioning.

Table 1. Moisture ratio modeling with different drying kinetic models.

Models	Ecuation	Type of conditioning	R^2	SE
Page	$XR=\exp(-kt^n)$	C1	0.983	0.052
		C2	0.994	0.032
Wang and Singh	$XR=1+at+bt^2$	C1	0.963	0.076
		C2	0.967	0.077
Midilli	$XR=a\exp(-kt^n)+bt$	C1	0.993	0.038
		C2	0.996	0.031

Midilli was the model that best predicted the drying kinetics of table olive powder.

Conclusion

A combination of conditioning, washing, and pressing steps prior to the drying process reduced salt content and improved drying kinetics, to obtain a new powdered ingredient from table olive by-products that could be used for new product development.

References

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