



1 Introduction



Crustacean production (2022):

10% of global capture and production from fisheries and aquaculture¹.

The shells represents approximately 47% of the animal. Contains liposoluble compounds (carotenoids)². Approximately 1 kg of molt shell per 100 kg of shrimp will be produced.



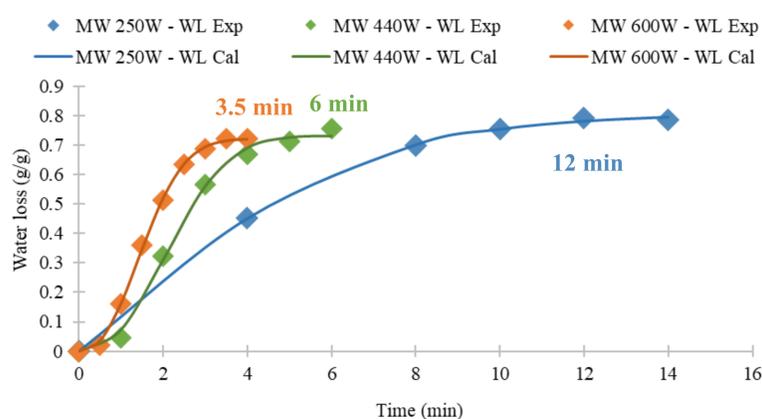
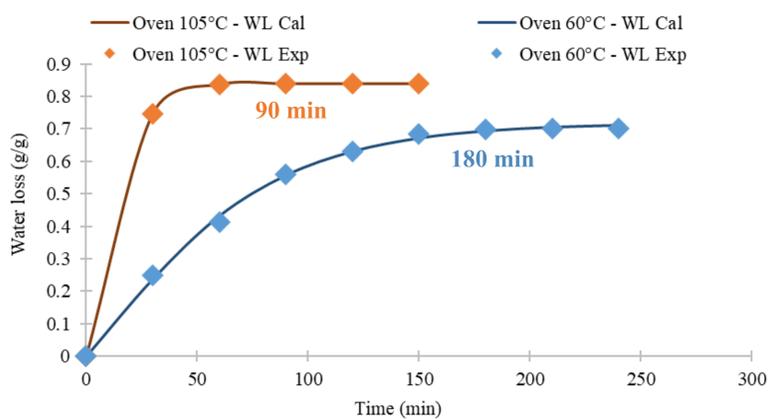
It needs cooking pretreatment to break the association of liposoluble compounds with macromolecules³. The literature has shown good extraction of lipid fraction with supercritical CO₂³.

Microwave pretreatment to increase the extraction yield of bioactive compounds has already been demonstrated with shorter processing time⁴.

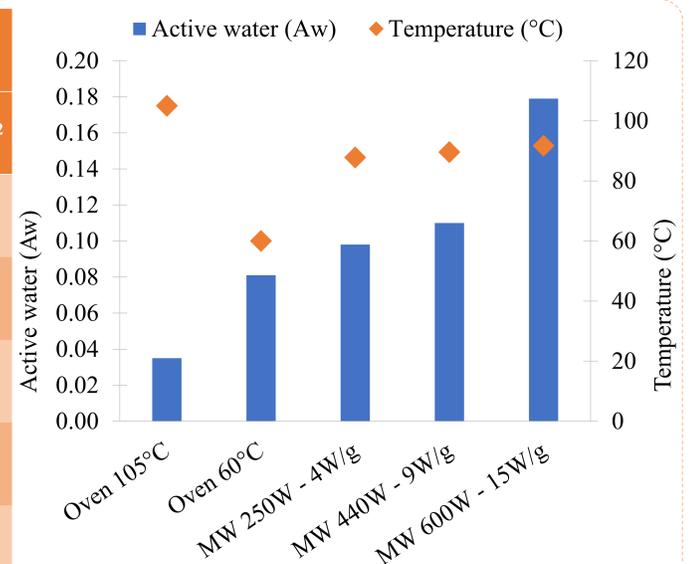


Study of the kinetics of drying *Litopenus vannamei* molt shell with microwaves at different powers to improve extraction yield of lipids and carotenoids (astaxanthin).

3 Results



Process	Pages Model ⁵ : $WL = WL_{\infty}(1 - e^{-kt^n})$			
	WL_{∞}	k	n	$\sum(WL_{exp} - WL_{cal})^2$
Oven 105 °C	0.84	0.017	1.43	$2.87 \cdot 10^{-7}$
Oven 60 °C	0.72	0.007	1.20	$7.81 \cdot 10^{-4}$
MW 250W	0.81	0.133	1.31	$1.99 \cdot 10^{-4}$
MW 440W	0.73	0.106	2.38	$2.18 \cdot 10^{-3}$
MW 600W	0.72	0.256	2.31	$5.09 \cdot 10^{-4}$



4 Conclusions and Future Work

Conclusions:

- Microwaves (MW) decreased the drying time compared to the conventional oven (180-90 min to 12-3.5 min, depending on the power density).
- The oven drying process (105 and 60 °C) fitted Page's model better (variation from experimental result: $7.81 \cdot 10^{-4}$ – $2.87 \cdot 10^{-7}$) compared to the microwave process (variation from experimental result: $2.18 \cdot 10^{-3}$ – $1.99 \cdot 10^{-4}$).

Future Work:

- Dried materials will be extracted with supercritical CO₂ to verify the influence of the pretreatment method on the yield and extract composition.

2 Methods

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