Active packaging material for food preservation

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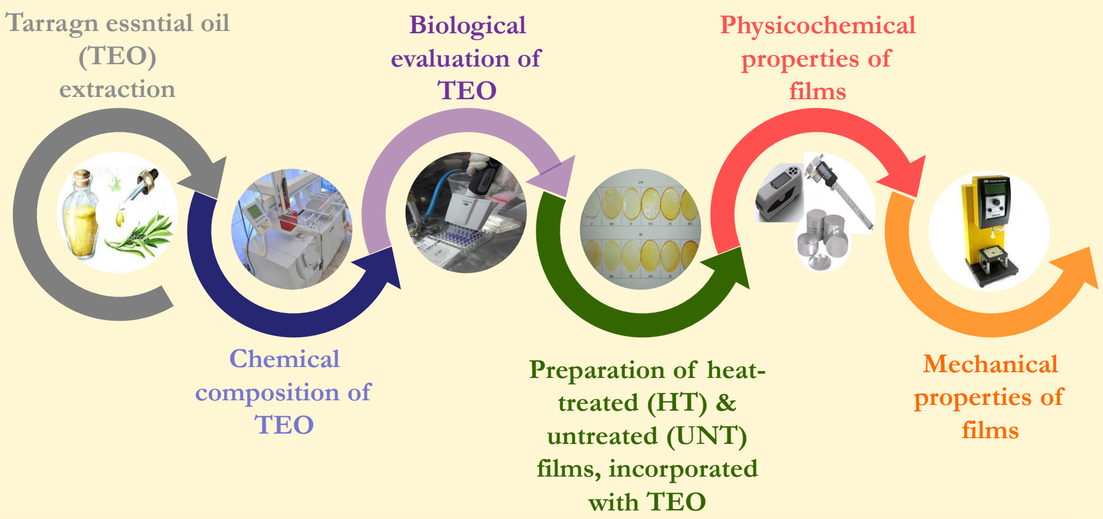
INTRODUCTION

In recent years, research has focused on the development of edible films and coatings with antimicrobial activity to control microorganisms that can cause food spoilage or food poisoning.

Edible films and coatings have many advantages such as biodegradability, edibility, bio-compatibility, aesthetic appearance, ability to resist physical stress, and barrier properties (permeability to moisture, oxygen, aroma, and oil).

Essential oils are among the active agents used to enhance the functionality of edible films. It is well known essential oils possess antioxidant, antibacterial, and antifungal properties and that their chemical compounds are responsible for these

EXPERIMENTAL DESIGN



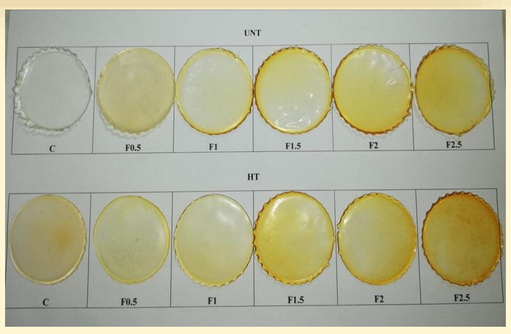
RESULTS

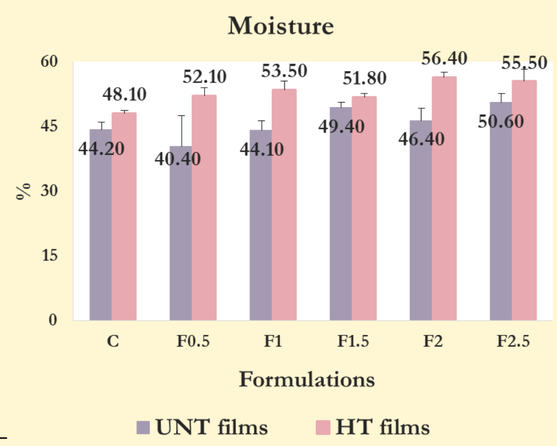
Relative contents (%) of volatile constituents identified in TEO

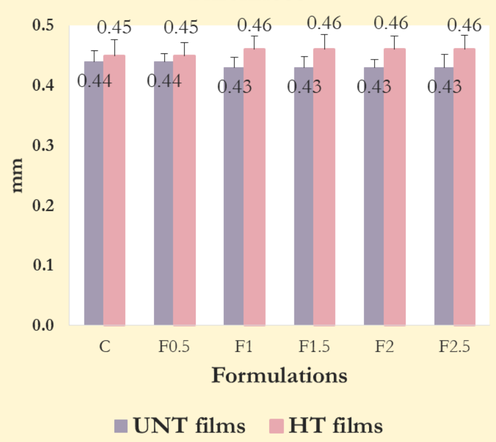
Nr. crt.	Compus	Clasa chimică	Timp de retenție	Conținut relativ
1	Hexanal	A.A.	5.451	0.18
2	**α-Felandren**	Hc.M.	9.695	**2.27**
3	α-Pinen	Hc.M.	9.959	1.35
4	**Sabinen**	Hc.M.	11.537	**74.98**
5	β-Pinen	Hc.M.	11.709	1.76
6	**β-Mircen**	Hc.M.	12.224	**3.38**
7	**4-Caren**	Hc.M.	13.306	**2.58**
8	o-Cimen	Hc.M.	13.627	1.10
9	**D-Limonen**	Hc.M.	13.806	**3.69**
10	1,8-cineol	M.O.	13.947	0.10
11	trans-β-Ocimen	Hc.M.	14.119	0.70
12	cis-β-Ocimen	Hc.M.	14.538	0.36
13	**γ-Terpinen**	Hc.M.	14.990	**3.80**
14	Terpinolen	Hc.M.	16.083	0.69
15	trans-4-Tuianol	M.O.	19.882	0.89
16	Eter de metil-izoeugenol	Phe.P.	27.898	2.18
-	**TOTAL**	-	-	**100.00**

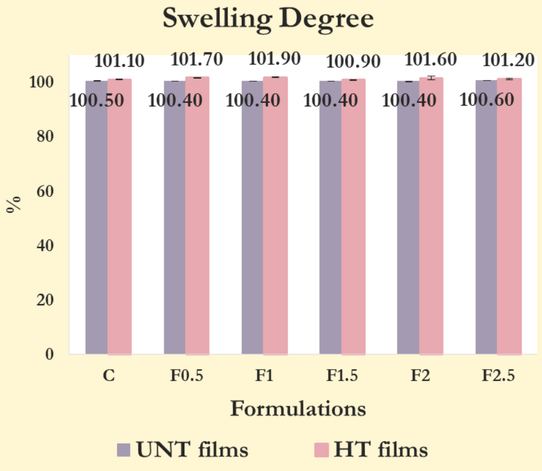
Diameters of inhibition zones, minimum inhibitory and bactericidal concentration of TEO

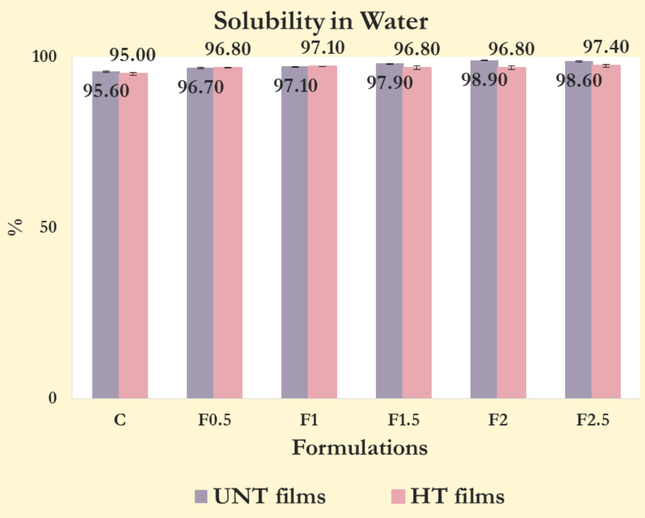
Bacterial strain	Kirby-Bauer DD (mm)	MIC (µL UE/mL)	MBC (µL UE/mL)
E. coli (ATCC 25922)	12.03 ± 0.47	**5.14 ± 0.0**	**5.14 ± 0.0**
S. enteritidis (ATCC 13076)	**14.41 ± 0.29**	10.80 ± 0.0	10.80 ± 0.0
S. aureus (ATCC 25923)	13.53 ± 0.38	10.80 ± 0.0	22.68 ± 0.0
L. monocytogenes (ATCC 19114)	11.42 ± 0.27	5.14 ± 0.0	10.80 ± 0.0

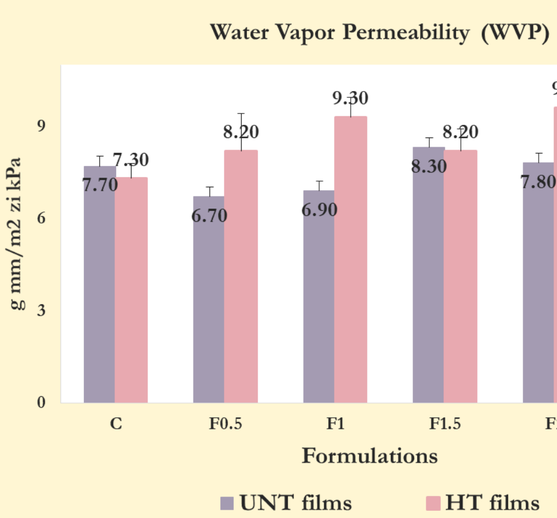


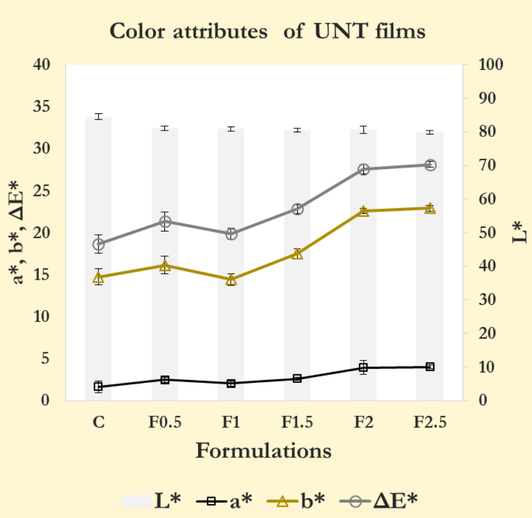


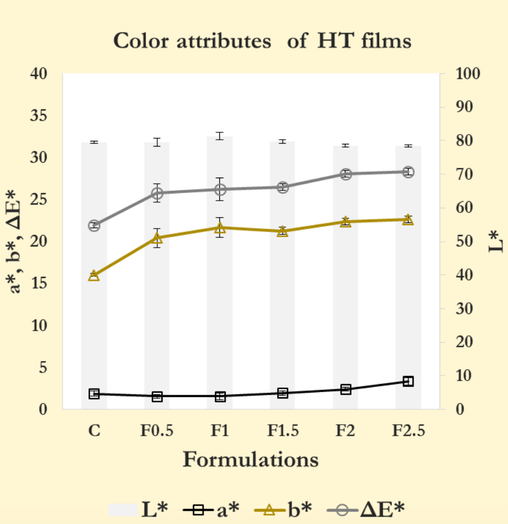


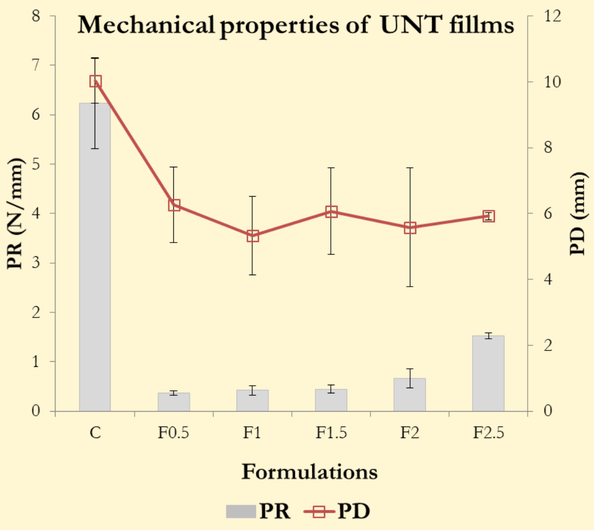


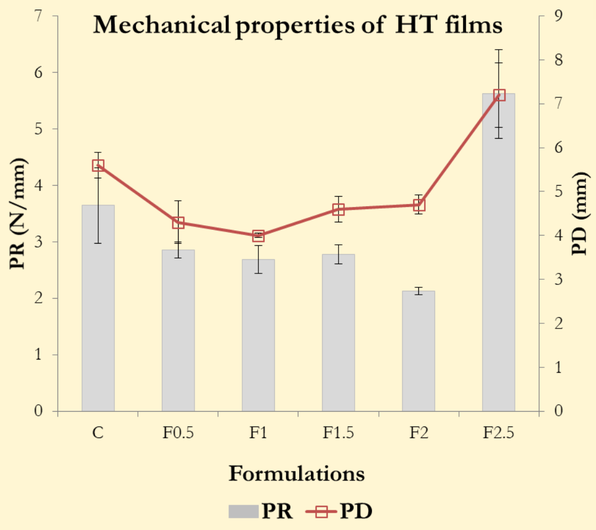












CONCLUSIONS

- ✓ TEO possess both, antioxidant and antibacterial activities
- ✓ When incorporated with tarragon essential oil, heat-treated films have the potential to be used as antimicrobial food packaging
- ✓ HT film showed improved physical and mechanical properties (more transparent, less soluble in water, more light protective, and more resistant to mechanical penetration)
- ✓ HT films are more suitable for food-packaging applications