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Active Edible Coatings for Fresh Food as a Suitable Alternative to Plastic

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INTRODUCTION & AIM

Nowadays, it is well-known that plastic is a global problem that affects both the environment and human health. For this reason, different institutions encourage the reduction of plastic use. One way to reduce single-use plastic is to use edible gels. These edible coatings serve the purpose of protecting and preserving fruit. This way, the use of petroleum-based plastic will no longer be necessary.

The aim of this work is to obtain plastic-free food coatings while maintaining the properties of fresh fruit.

imacromat
INNOVATIVE MACROMOLECULAR MATERIALS

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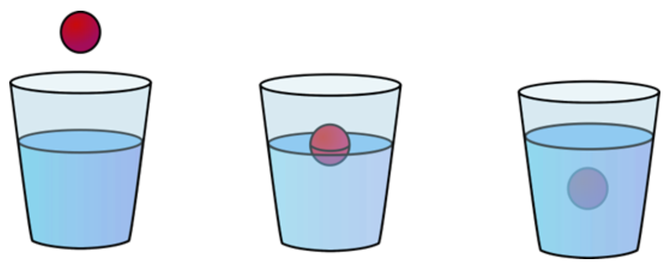
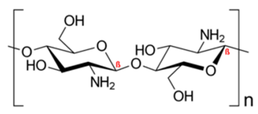
METHOD

To determine the effect of edible coating in fresh fruit, fresh tomatoes and strawberries were used as samples. They were covered with different solutions, and their evolution was analysed over time (30 days).

To cover fresh fruit they were inmerse in different solutions

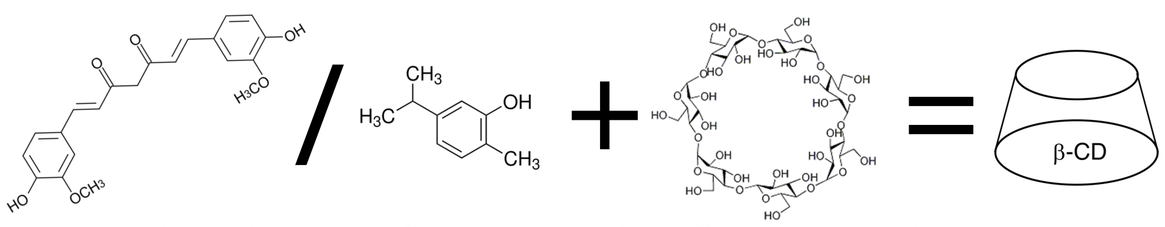


WHAT solutions



Concentration of active compounds efffect: 0.5%, 1.0% and 1.5% in 0.5% chitosan solution, crosslinked with a subsequent immersion in sodium triphosphate pentabasic solution.

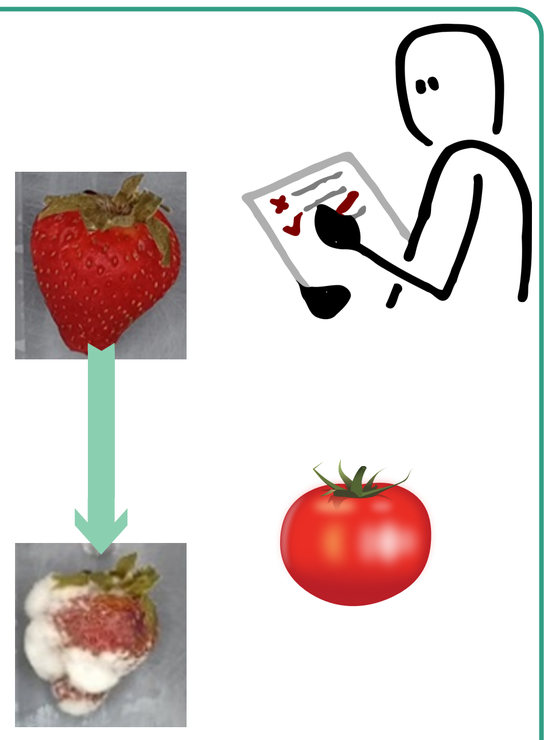
- Carvacrol
- Curcumin
- Polyphenolic extracts from strawberries and red algae (*Gelidium sesquipedale*)
- β-cyclodextrin inclusion complexes of curcumin and carvacrol
  - Complexes were characterised by FTIR spectroscopy to confirm their formation.



Curcumin/chitosan + β-cyclodextrin = β-cyclodextrine complexe

RESULTS & DISCUSSION

Active compound	[%/100 mL]
Control	
-	0,5
	1
	1,5
Carvacrol	0,5
	1
	1,5
Curcumin	0,5
	1
	1,5
Strawberries polyphenols	0,5
	1
	1,5
Seaweed polyphenols	0,5
	1
	1,5
β-ciclodextrin inclusion complex carvacrol	0,5
	1
	1,5
β-ciclodextrin inclusion complex curcumin	0,5
	1
	1,5



→ The tomatoes coated with curcumin did not show mould proliferation.

→ In contrast, those coated with carvacrol developed mould.

→ β-cyclodextrin complexes were the **longest-lasting tomatoes,** followed by the polyphenolic compounds at higher concentrations.

CONCLUSION

Importance of the composition of coatings in protecting and preserving fresh foods like tomatoes and strawberries, as well as the influence of proportions of active compounds.

ACKNOWLEDGEMENT

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