Antioxidant activity of alginate edible films containing plant extracts

Ana Isabel Lopes[1], Sara Silva[1], Lillian Barros[2], Cristina Caleja[2], Eliana Pereira[2], Freni Tavaria[1], Manuela Pintado[1]

[1] Universidade Católica Portuguesa, CBQF- Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005 Porto, Portugal

[2] Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253, Bragança, Portugal

Email: mpintado@ucp.pt

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Introduction

Traditional food packaging is usually made of plastic. Plastics are mostly produced with polymers from non-renewable sources contributing to environmental pollution. Edible films can act as complements to traditional plastics because their functional properties are able to extend food's shelf-life[1].

Plant extracts may be a source of valuable bioactives, in particular polyphenols, that exhibit antioxidant activity. They can be effective at low concentrations, are affordable and easy to apply, presenting low toxicity levels and high stability during processing and depending on the extract may not affect the sensory characteristics of food products[2].

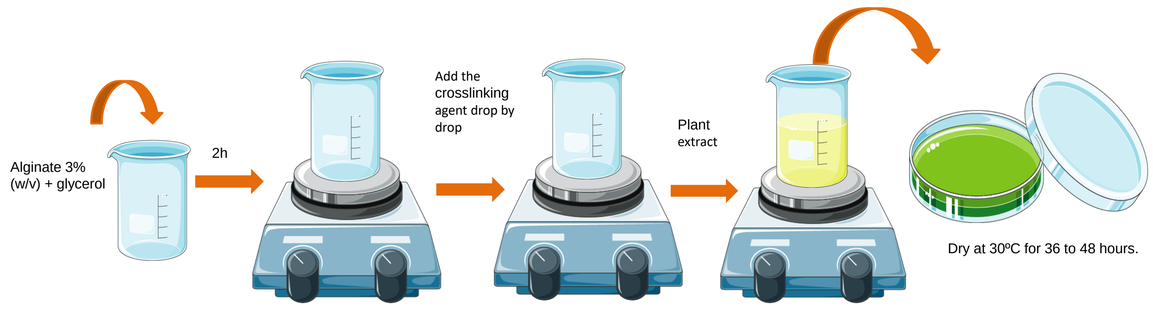
The addition of antioxidant and antimicrobial plant extracts to edible films confers them the ability to act as food preservatives against a broad spectrum of food poisoning/contaminants microorganisms and taking the opportunity of their antioxidant properties they avoid the deterioration of fats and other food constituents [3].

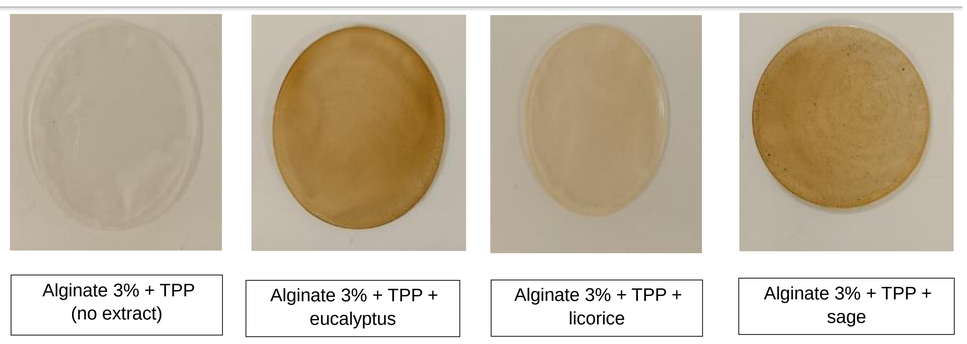
Objective

In this work the antioxidant activity of alginate edible films containing extracts of licorice (*Glycyrrhiza glabra* L.), eucalyptus (*Eucalyptus globulus* Labill.) and sage (*Salvia officinalis* L.) was evaluated by 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) and 2,2-difenil-1-picrilhidrazil (DPPH) scavenging tests.

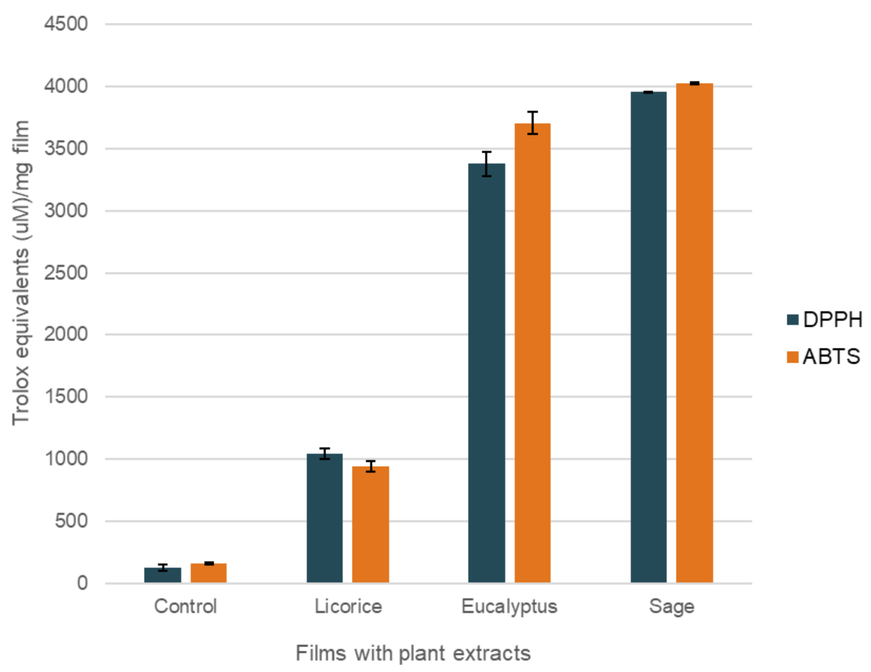
Methods and Results

Preparation of alginate films





Antioxidant activity determination by ABTS and DPPH scavenging assays



Conclusions

The film incorporated with sage extract was the one that presented the best antioxidant activity by both ABTS (4024,169 Trolox equivalents (mM)/mg film) and DPPH (3954,813 Trolox equivalents (mM)/mg film), followed by the film with eucalyptus extract (ABTS: 3706,291 Trolox equivalents (mM)/mg film; DPPH: 3706,291 Trolox equivalents (mM)/mg film). On the other hand, the film incorporated with licorice extract (ABTS: 942,5195 Trolox equivalents (mM)/mg film; DPPH: 1040,669 Trolox equivalents (mM)/mg film) was the one with least antioxidant activity. So, the incorporation of plants allow to create antioxidant preservative films to apply in different food matrixes and the range of effectiveness may be tailored made according the selected plant extract.

References

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