

Edaravone-Loaded Sodium Alginate/Carboxymethyl Chitosan Composite Film for the Healing

Jian-Xiao LI, Chao XU, Chang-Kai SUN*, Shui GUAN*

Dalian University of Technology, Dalian 116024, China

Introduction

High levels of reactive oxygen species (ROS) in the wound surface are one of the reasons why chronic wounds are difficult to heal. Using of free radical scavengers to reduce ROS levels and reduce the duration of toxic effects of ROS can accelerate the healing of chronic wounds.

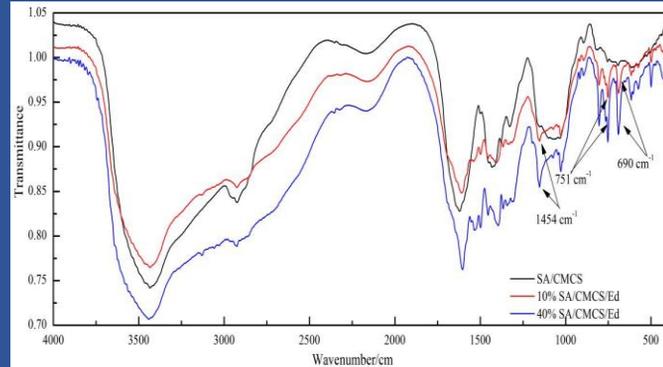
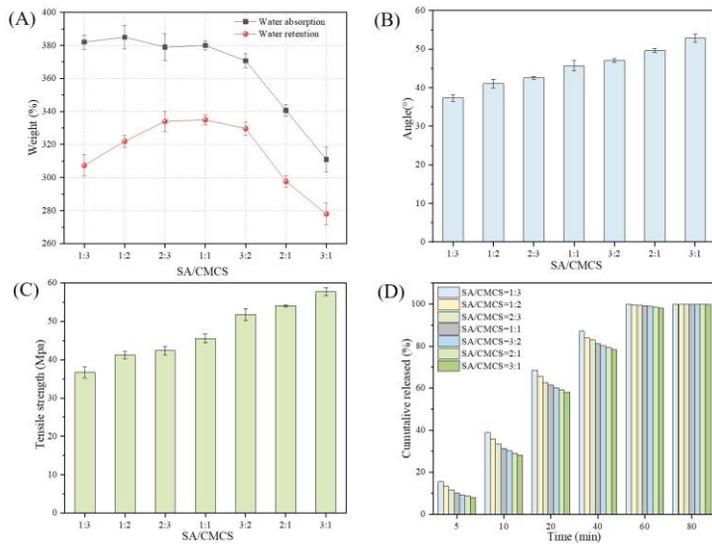


Fig. 1 FTIR spectrum of SA/CMCS, 10%SA/CMCS/Ed and 20%SA/CMCS/Ed.

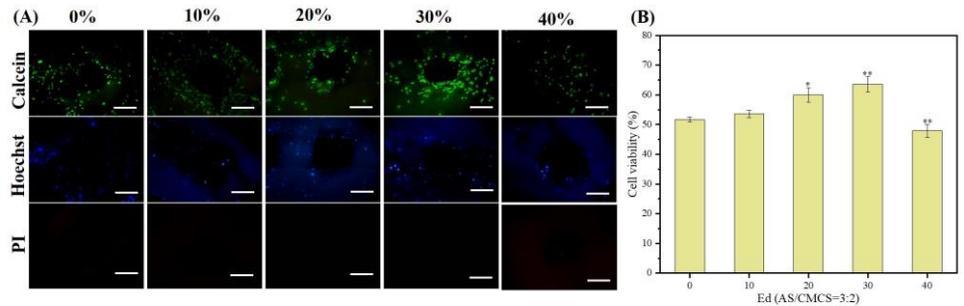


Method

In this study, a novel edaravone (Ed)-loaded sodium alginate (SA)/carboxymethyl chitosan (CMCS) antioxidant composite film was prepared, and the physicochemical properties and biocompatibility were analyzed.

Fig. 2 (A) Water absorption and retention, (B) contact angles, (C) tensile strength, and (D) *In vitro* release behavior of Ed-loaded SA/CMCS films.

Fig. 3 (A) The live/dead staining of mouse skin fibroblasts on Ed-loaded SA/CMCS films (0%, 10%, 20%, 30% and 40% Ed, respectively); (B) The effects of Ed-loaded SA/CMCS films against H₂O₂-induced oxidative damage. Control: 0 group, (*) $p < 0.05$, (**) $p < 0.01$, statistically different from control.



Conclusion

The SA/CMCS/Ed films were hydrophilic, with excellent water absorption and water retention, and also exhibited adequate mechanical properties. The exploratory drug release investigation revealed that the increase in SA content plays a critical role in the Ed release process by improving the binding ability of the composite film to the drug, resulting in slow release.

Acknowledgements

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