結蘭膠/大豆分離蛋白/花青素複合膜之製備及應用

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摘要

現代的科技越來越進步，食品保存方面除了食品本身，包裝功能也漸漸走向智慧型包裝的發展。花青素屬於一種無毒、水溶性色素，有著在不同 pH 值環境下會快速變色的特性，且身為酚類化合物，擁有良好的抗氧化特性及其他生理功能。結蘭膠是一種線性的負電荷胞外多醣，能透過簡單方式製備成水膠，此水膠硬度高，且能夠耐熱及酸。大豆分離蛋白，具有優秀的乳化及發泡能力，且有研究指出大豆分離蛋白若與花青素結合可以有效穩定花青素結構。本研究是以花青素、結蘭膠及不同濃度大豆分離蛋白製成複合膜，測試其在不同 pH 值下的敏感度、物理化學分析、抗氧化性質及應用於感測食品新鮮度。結果得知含有花青素的複合膜在不同 pH 值下有良好敏感性。在掃描式電子顯微鏡下觀測到添加花青素後複合膜擁有較緊密的結構。研究顯示複合膜在 $ABTS^{+}$及 DPPH 自由基清除實驗中經 5 小時後，清除率分別為 72.78%與 59.25%。在由於生鮮食品在腐敗過程中會產生揮發性鹽基態氮等會改變食品 pH 值的物質，此複合膜可以簡單感測 pH 變化，進而了解食品新鮮度狀況。因此複合膜可望成為純天然生物可降解、可檢測 pH 值變化且抗氧化的多功食品能包材。

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