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Antimicrobial packaging based on starch, poly(3-hydroxybutyrate) and poly(lactic-co-glycolide) materials and application challenges

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Abstract

Background

In recent years, food packaging has focused on two scientific pillars; adopting the biodegradable packaging materials and development of antimicrobial packaging for extended shelf life, quality and safety of food products. The bioplastic materials provide a promising application in the packaging industry to substitute environmentally deleterious petrochemical-based plastics.

Scope and approach

This paper gives insights to very recent progress on the antimicrobial application of starch, polyhydroxybutyrate (PHB) and poly (lactic-co-glycolide) (PLGA) as well as their blends and nanocomposites in food packaging research. It also presents an overview of the antimicrobial application of these materials particularly in food and biomedical industry.

Key findings and conclusions

PHB, starch and PLGA materials have unique properties towards novel application in foods, cosmetics, medicines as well as various composites. The materials necessitate critical studies to improve their industrial performance both for processing engineering and antimicrobial packaging due to functional and technical limitations.

Keywords

Bioplastics; Food packaging; Food safety; Food spoilage; Nanocomposites; Shelf life