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Edi-Pack

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ABSTRACT

Edi-Pack is an orange peel and starch-based innovation which is enhanced with natural antimicrobial and antioxidant properties, biodegradable, utilises orange peel waste, alternative for single use plastic while remaining safe and edible which produces no waste. This work involves the development of a biodegradable edible film through the addition of potato starch and orange peel extract, emphasising the utilisation of natural and readily available materials to address issues related to environmental sustainability. The initial phase involves the systematic extraction and diligent preparation of raw materials. Potato starch is selected due to its biodegradability and film-forming characteristics. Orange peel extract is derived from the drying and grinding of peels, which include antimicrobial agents such as limonene and flavonoids. This provides the edible film with good mechanical properties for packaging purposes, including flexibility and tensile strength, and also with natural antimicrobial effects. The applications are not only limited to edible food packaging. It can be used as a biofilm. In addition to serving as barriers, edible films possess the ability to substitute synthetically polymer films and, in comparison with more conventional, not very environment friendly packaging elements, feasibly reduces complexity and enhance recyclability. Edible films are typically treated with plasticisers to increase their pliability and toughness. Edible packaging made after optimisation has thickness 23 micron and water permeability 1.28g/m^2 day which can easily biodegrade in soil and has good water solubility. The shelf-life study showed that it can be stored at low temperature (-18°) and at room temperature (30°) for 28 days and more (shelf-life study is still going on) without any change in appearance, taste and texture.

Keywords: Antioxidant, Biodegradable, Plastic film

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