

Consolidating plant-based essential oils onto polysaccharides-based coatings: Effect on mechanisms and reducing postharvest losses of fruits

ABSTRACT

Fruits are highly perishable and prone to biological abnormalities and damage. Currently, insecticides and fungicides are utilized to control food spoilage. Due to consumer concerns and the rising need for safer products, attempts are being undertaken to develop eco-friendly components from essential oils (EOs) and bio-polysaccharides. Numerous studies have examined the *in vitro* efficiency of essential oils on various fruit pathogenic bacteria by evaluating the minimum inhibitory concentration (MIC) and the percentage of the pathogen's inhibition. The presence of extensive phytochemicals and bioactive components in essential oils are mainly associated with its pathogen inhibitory mechanisms that can disrupt pathogen cellular metabolism. The antimicrobial and antioxidant activities of polysaccharides-based coatings are said to be enhanced in the presence of essential oils. The vast majority of volatiles and essential oils produced by plants are recognized as GRAS for humans and should be consumed not exceeding their permissible dose. Previously, they are *in vivo* (in storage) and *in situ* (in the field) uses were not well documented. Therefore, in this review, we examine the efficacy, main phytochemical components, and mechanisms of action of incorporating essential oils into polysaccharides-based coatings matrices to control microorganisms on fruits.