NANOFIBROUS MEMBRANES FOR THE APPLICATION IN POST-HARVEST TECHNOLOGIES

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ABSTRACT

Grapes are lost annually due to spoilage by *Botrytis Cinerea.*[1, 2] *B. Cinerea* is currently controlled by spraying the crops with fungicides or SO_2 fumigation in the storage rooms, but with limited success.[1, 3-5]

In this study two different polymer nanofibrous membranes were synthesized with the aim to prevent spoilage due to *B. Cinerea*. The first polymer was modified using a positively charged quaternized nitrogen moiety that was subsequently reacted with sodium metabisulfite through an ion exchange process. The modified polymer was electrospun into nanofibrous mats for the benefit of the nanofibers' high available surface area. Sodium metabisulfite released SO_2 upon reaction with water vapour, which resulted in the inhibition of conidium germination of *B. Cinerea.* [4, 6]

The second polymer was synthesized and electrospun into polymer nanofibrous mats followed by further chemical modification. This post-electrospinning modification resulted in the covalent attachment of an organic compound with anti-fungal properties, which resulted in the inhibition of mycelium growth of *B. Cinerea.* Anti-fungal studies were conducted using the 2 modified polymer nanofibrous mats with *B. Cinerea* to evaluate these nanofibrous surfaces as *B. Cinerea* inhibiting membranes. Results indicated that *B. Cinerea* conidium and mycelium germination were successfully inhibited.

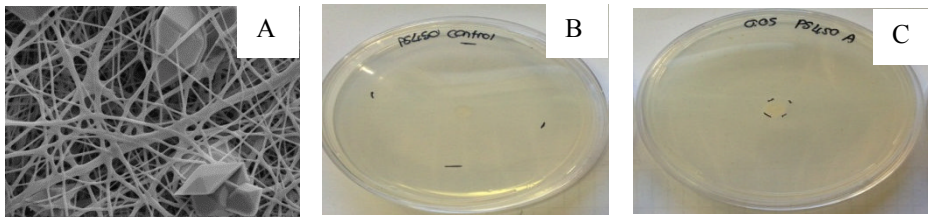

Fig. 1: (A) SEM image of incorporated sodium metabisulfite within polymer nanofibres, (B-C) comparison of mycelium germination of B. Cinerea. (B) is the control with no organic compound and (C) is with organic compound

References:

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