255 Characterization of inclusion complexes with antifungal activity applied to active packaging.

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Chile is a major exporter of fresh fruit, table grapes highlighting ≈ 800 000 tons over a period of four months [1]. Among the main reasons for this decline in post- harvest fruit is the action of microorganisms, such as the attack by the plant pathogen *Botrytis cinerea mold*. In Chile this situation generates losses of about 22% and globally about 20% in fruit exports. Currently, the situation is addressed at the level of packing fruit, incorporating SO_2 generating pads, in order to control decay caused by fungus. However, the use of this system has a number of limitations, such as whitening and development of surface lesions in rachis and berries, altered smell, taste, negative effects on human health and air quality within other, so their use is being questioned internationally [2]. This paper proposes the design of an active packaging with the ability to control the growth of *B. cinerea* using natural compounds with antimicrobial activity that are not detrimental to product quality, consumer and environment. The preparation of inclusion complexes between beta cyclodextrin (B-CD) which range size is around 0.6-10.0nm and a natural volatile active agent (NVA) with antifungal properties was proposed in proportions B-CD: NVA (1:0,5; 1:1; 1:2), this encapsulation process could be considered nano-encapsulating of active agents according to Marques, 2010 [3]. Subsequently, it will be incorporated into a polymer matrix to obtain an active packaging. In order to check the formation of inclusion complex (β-cyclodextrin: NVA), entrapment efficiency analysis, Spectroscopy Fourier Transform Infrared (FTIR), X-ray diffraction (XRD) (Figure 1), differential scanning calorimetry were performed (DSC), thermogravimetric analysis (TGA), showing interaction between β-cyclodextrin and CNV outcoming from the inclusion complex formation. Furthermore, their antifungal ability, in vitro under conditions of 20 °C for five days, shows a significant decrease in the radial growth of *B. cinerea*. The diffraction patterns obtained for B - CD with respect to inclusion complexes denoting a change in the crystallinity of the starting cyclic oligosaccharide, confirming the formation of a new nano-structure.

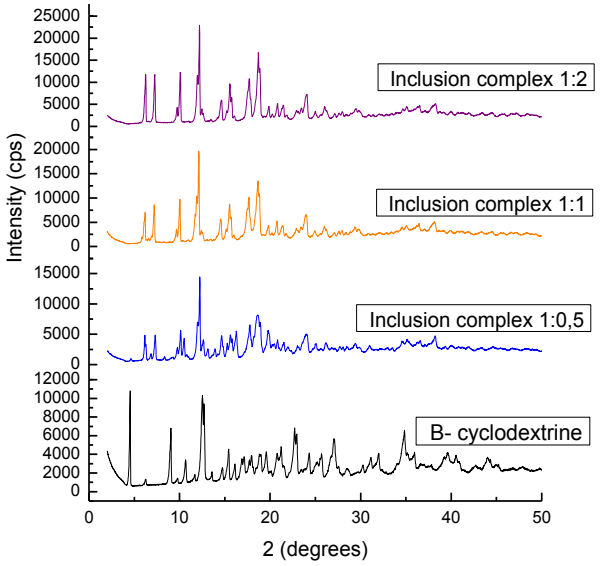

Fig. 1 *Analysis of X-ray diffraction of B-CD and their inclusion complexes showing changes in crystallinity of B-CD by interacting with the active compound, generating a new structure.*

References

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